

THE SUPPLEMENT
TO THE
UNITED STATES NAVAL MEDICAL BULLETIN

PUBLISHED FOR THE INFORMATION OF

THE HOSPITAL CORPS
OF THE NAVY

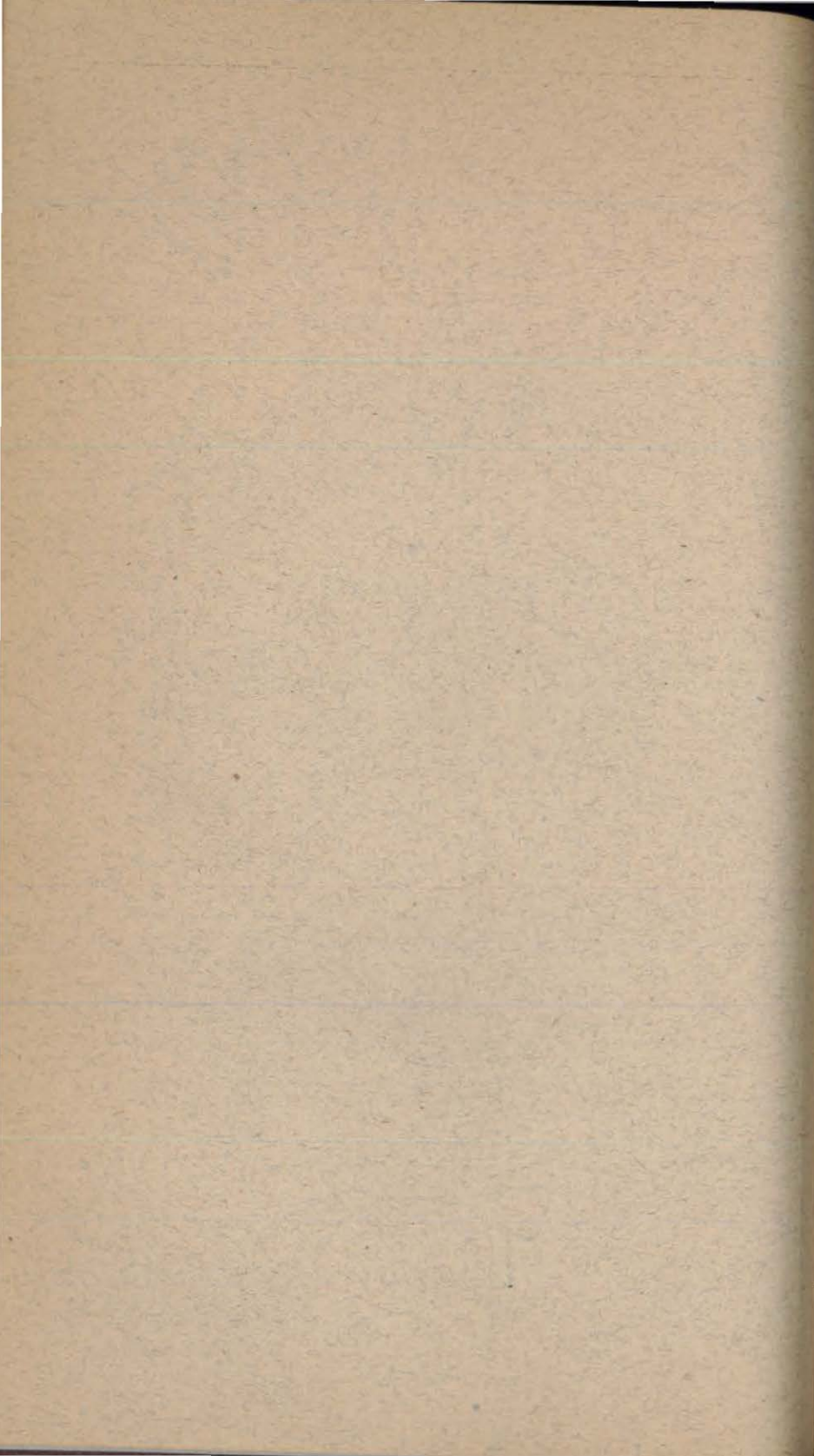
ISSUED BY
THE BUREAU OF MEDICINE AND SURGERY
NAVY DEPARTMENT
DIVISION OF PUBLICATIONS
MEDICAL INSPECTOR J. S. TAYLOR, UNITED STATES NAVY
IN CHARGE

EDITED BY
PASSED ASSISTANT SURGEON G. F. COTTLE
UNITED STATES NAVY

APRIL, 1918
(NUMBER 5)



WASHINGTON
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NAVY DEPARTMENT,
Washington, March 20, 1907.

This United States Naval Medical Bulletin is published by direction of the department for the timely information of the Medical and Hospital Corps of the Navy.

TRUMAN H. NEWBERRY,
Acting Secretary.

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PREFACE.

From the first issue of the United States Naval Medical Bulletin it has been intended as a vehicle of communication with the Hospital Corps, and to be the means of imparting information and instruction to it as well as to the Medical Corps of the Navy. The recent expansion and improvement of the Hospital Corps seems now to justify more direct methods and the material prepared for that body will hereafter be issued in the form of a SUPPLEMENT.¹

Contributions for the SUPPLEMENT are desired from members of the Hospital Corps and from other sources, but the Bureau does not necessarily undertake to indorse all views and opinions expressed in these pages.

W. C. BRAISTED,
Surgeon General, United States Navy.

¹The present issue is No. 5. Nos. 1 and 2 appeared incorporated in the July and October issues, respectively, of the United States Naval Medical Bulletin.

PREFACE

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W. F. HARRIS

Surgeon General, United States Navy

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REMARKS ON FIELD SANITATION.

FOR MEMBERS OF THE HOSPITAL CORPS SERVING WITH MARINES.

By W. L. MANN, Passed Assistant Surgeon, United States Navy.

The Marine Corps is now larger than our standing army was before the Spanish-American War, and is dependent upon the Medical Department of the Navy for its medical assistance. Mention is made of this point in order to remind members of the Hospital Corps that at any time they may be called upon to serve on land with these sailor soldiers. So far as known, there has been no previous specialized attempt to instruct the Hospital Corps for the important duty of field service. At Quantico, Va., an endeavor is being made to present the elementary principles of field sanitation and hygiene to hospital corpsmen under instruction, approximately five hundred of whom have been attached to this station at different periods during the past six months.

Many simple types of field and trench sanitary appliances have been constructed by these men for demonstration purposes. These include several varieties of latrines, urinals, incinerators, dressing and first-aid stations, etc.

VALUE OF SANITATION.

One of the prime requisites for victory is health.

An army in order to fight has to, literally and figuratively, "*take the field*." Consequently *field* hygiene and sanitation is one of the most important subjects for military sanitarians, as, at this time the laws of preventive medicine are made applicable to war, and this adaptability to war-time conditions is the supreme test of all military efficiency.

The functions of a medico-military organization may be roughly divided into, (a) prevention; (b) treatment of disease. Prevention is of such vast importance to the military personnel that this function only will be considered in this article. The measures undertaken for the prevention of disease have probably saved many more lives than curative medicine, thus emphasizing the old adage "An ounce of prevention is worth a pound of cure."

Concisely expressed, the major portion of field sanitation may be grouped as follows:

1. Food and water.
2. Conservancy (proper waste disposal).
3. Insect control.
4. The march.
5. The trenches.

It is proposed in these remarks to give only an outline of field sanitation, and no claim of originality is made. To Assistant Surgeon C. L. Fackler, U. S. N. R. F., I wish to acknowledge my indebtedness for the valuable assistance rendered in the preparation of this article.

FOOD AND WATER.

Food.—In the field a large percentage of the rations are issued in tin containers, which, due to improper preparation, exposure to excessive heat, and lack of care in handling, frequently undergo decomposition and are especially dangerous to health if their use is permitted. Therefore a careful inspection of all canned goods should be required. The terms “springers” and “swells” are applied to bulged, blown, or swollen cans. These cans, when pressure is made on the ends, give a crackling sound. “Springers” are caused by overloading the cans, and, while not desirable, the contents are suitable for use. “Swells” are caused by the formation of gas due to decomposition and may be differentiated from “springers” by a splashing sound when the can is shaken and a hollow note when gently tapped. These should be condemned.

Occasionally the inside of a can may present a blackened appearance (so-called “can burn”). This condition is not due to putrefaction, but is caused by the precipitation of stannous sulphide in an acid medium. Formerly a can with two solder holes was indicative of a “swell” which had been punctured to let out the gas and then resoldered, but now many manufacturing firms use two solder holes in sealing their cans. It is well to reject cans with three solder holes.

Water.—Water constitutes 60 per cent of the body weight, or the equivalent of 10 gallons in the average man’s body. The loss of 1 gallon of this body water has serious consequences; and if $1\frac{1}{2}$ gallons are lost the result is fatal. It is estimated that 1 quart of water is sufficient for about $7\frac{1}{2}$ miles of marching under ordinary climatic conditions.

Daily allowance.—The average water allowance in camp is as follows: Two gallons per man and 10 gallons for a horse. The minimum per man is one-half gallon for drinking and one-half gallon for cooking purposes. Six gallons is the minimum for a horse.



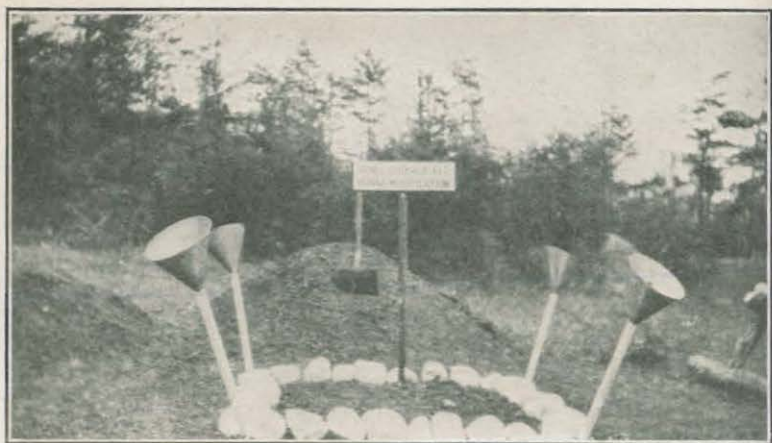
A row of latrines and urinals.



The "Lucas" and "Back to Back" modification of straddle trenches.



The Army "Leavenworth" type pit incinerator, built one-half scale.



Modified urinal soakage pit with replaceable screened tin funnels.



Caldwell incinerator.



Improvised field shower bath, soakage pit, and soap trap for waste water.



Bench latrine.



Source.—The sources of water are divided into (a) surface water, such as lakes, ponds, etc.; (b) underground, which includes wells, springs, etc. All these vary in degree as to purity and potability. Rain water is usually the most satisfactory of any of the natural waters. Large bodies of water, for example large lakes, are more likely to contain pure water than smaller ones, because of the greater dilution of contaminating material.

One should be suspicious of all surface water. The appearance of a water is no index of its purity. Consider all water contaminated until tests prove it otherwise. Wells are of two varieties, "deep" or "shallow." Water taken from shallow wells is always suspicious, while water from deep wells or deep springs is usually fit for human consumption.

If water is used from a running stream, it should be taken at a point where there is considerable depth and the current strong, and always "upstream," or, in other words, above the camp site. Provisions for watering horses should be made below, and for washing clothes, still farther downstream.

Storage, collection, and distribution.—Water receptacles should be kept well covered. As the ground in close proximity is likely to be wetted, it is best to build a sand or gravel pit 2 feet square and 1 foot deep to absorb the waste. The receptacles should be cleaned daily with boiling water, or, better still, rinsed with a solution of one-third of a teaspoonful of potassium permanganate to 1 gallon of water or with a solution of chlorinated lime, 1-1,000. These are harmless and more certain in their action than boiling water used alone.

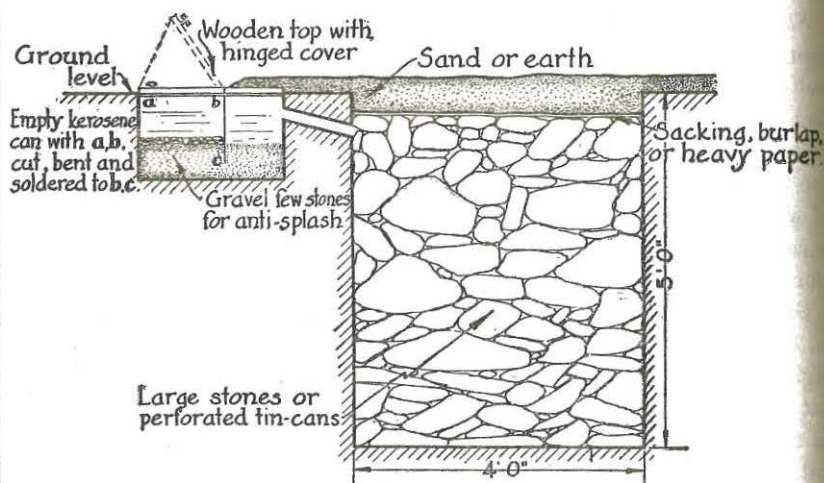
Canteens when not in use should be emptied and dried and should be frequently washed with the above solution. Weak tea has been highly recommended for use in the canteens. It should be boiling hot when poured in, thus insuring sterility of the canteen as well as the contents. Common drinking cups should not be used. If individual cups can not be supplied, lip drinking should be practiced. Should conditions arise which make it absolutely necessary to use common drinking cups, a certain degree of safety can be insured by keeping the cup immersed in a solution of 1 per cent formalin when not in use.

Purification.—Boiling the water for 10 minutes is the simplest and best method of purification. Should the water be turbid, it may be clarified by the addition of six grains of alum to the gallon, stirred well, and allowed to settle.

Chlorination is extensively practiced to-day. Hypochlorite of calcium (bleaching powder), the agent used, is on the supply table (form "B") under the caption Calx chlorinata, U. S. P. A simple

formula for its use is as follows: Dissolve one-half teaspoonful of chlorinated lime, taken from a freshly opened container, in 1 pint of water, and label this "Stock solution." This solution deteriorates rapidly and a fresh solution should be prepared every four days. One-half teaspoonful of this stock solution added to each gallon of water, stirred well and allowed to settle for 20 minutes, will insure the destruction of all bacteria.

CONSERVANCY, OR THE DISPOSAL OF WASTE.



· CROSS · SECTION ·
 · SOAKAGE · PIT · FOR · WASTE · WATER ·
 · WITH · GREASE · AND · SOAP · TRAP ·
 (AFTER · LELEAN)

Waste may be divided as follows:

1. Refuse—

(a) Garbage.

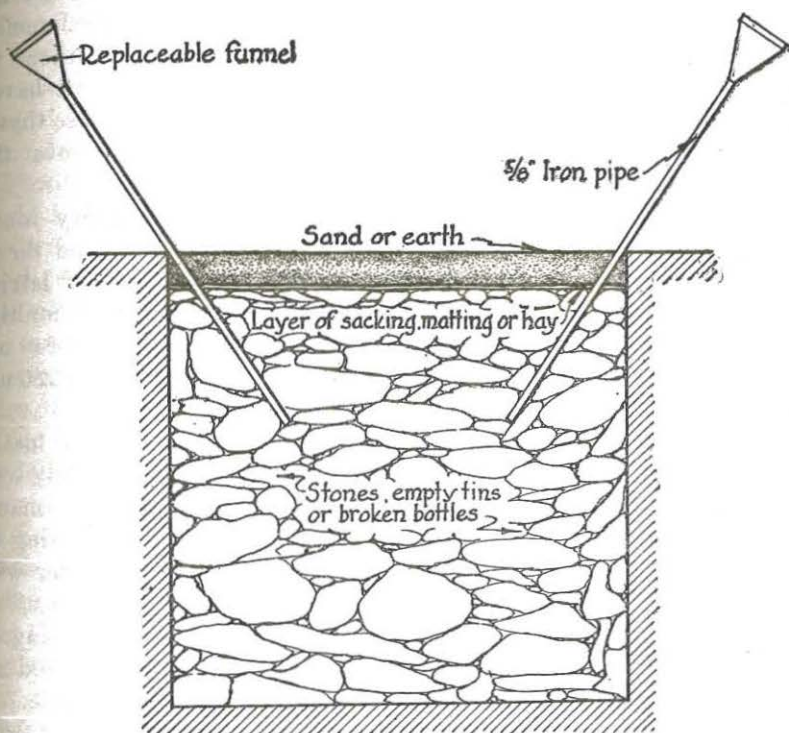
(b) Rubbish (boxes, paper, etc.).

2. Excreta—

(a) Night soil (urine and feces).

(b) Manure.

Collection of waste.—Metal garbage cans if available, if not, wooden or cardboard boxes may be substituted, should be placed at intervals in the company streets for the deposit of waste paper,



·CROSS-SECTION·
·URINE·SOAKAGE·PIT·

MODIFIED FROM "LELEAN"

burnt matches, fruit peelings, cigarette stumps, etc. This accomplishes primary cleanliness of the camp and inculcates the habit of tidiness in the men.

Garbage cans should be well covered and placed on raised platforms at least 2 feet above the ground. The soil beneath these platforms is easily contaminated by the overflow or drippings and requires careful supervision to prevent pollution and fly breeding. The surface should be scraped or raked daily and shoveled into the garbage can. Fresh dry earth is then spread over the scraped area. The promiscuous use of lime to cover over filth is not recommended.

The ultimate disposal of waste.—The final disposal of waste is ultimately confined to two procedures, viz., burning or burial.

Burial was the earliest means of disposal and is instinctive in many of the lower animals. Perhaps you have noticed that a dog attempts to cover up his dejecta. Moses in his advice to the Israelites in Deuteronomy says: "Thou shalt have a place also without the camp, whither thou shalt go forth abroad: And thou shalt have a paddle upon thy weapon; and it shall be, when thou wilt ease thyself abroad, thou shalt dig therewith, and shalt turn back and cover that which cometh from thee."

In determining the total length of latrine pits necessary for an organization, multiply the number of men by one-tenth and the result will be the expression in yards of the total length of latrines required, except in commands of less than 400 men, when a multiple of one-seventh should be used. For example, a regiment of 940 men will require 94 yards of latrine frontage, while a battalion of 280 men will need 40 yards (280 times $\frac{1}{7}$ equals 40).

Location and care of the latrines.—The latrines should be located at a distance of at least 50 yards from the camps and as widely separated from the kitchens as possible. In open latrines each man is required to cover his excreta with fresh earth. Each morning the pits may be burnt out with straw and crude oil. Still better when latrines are boxed over as in the "Harvard knock-down box," the inside of the pit and box should be thoroughly blackened, using one pound of bone black to three gallons of crude oil. This method acts as a deterrent to flies and they will not light upon this surface.

Types of latrines.—The type most easily constructed is the straddle trench, known as the 1-2-3 latrine, the dimensions of which are easily remembered, viz., 1 foot wide, 2 feet deep, and 3 feet long. These are highly recommended because of the slight possibility of the sides being soiled with urine or feces. They may be boxed over with seats arranged back to back or constructed according to the Lucas modification.

An important point to remember is that the bacteria which disintegrate the urine and feces are found in the upper layers of the soil, and for this reason these superficial latrines permit a more rapid sterilization of the dejecta than the deep trenches. See "Hand Book" for specifications of bench latrines.

During the halt shallow ditches may be dug with a stick, trench shovel, or the bayonet. In a camp of a few days' duration, the straddle trenches will suffice. For camps of longer occupation, deep latrines, boxed over with the Harvard latrine box are recommended.

All trench latrines, when they become filled to within half a foot of the surface, should be well covered over with earth and labeled with an "L." This serves to inform future occupants of the location of abandoned latrines.

In camps, not of a permanent nature or when troops are constantly on the move, burial is the most convenient and the only rapid means of waste disposal and is universally practiced in our modern armies. Compared with incineration, when the latter is possible, as in a permanent camp, incineration has the advantage of complete destruction of all waste and is the better method from a sanitary viewpoint.

Specifications of incinerators.—Caldwell type: This is the name applied to two trenches dug at right angles to each other, intersecting in the center. The dimensions are: Length, 6 feet; width, 1 foot; depth, at the center, 1 foot. There is a gradual slope upward from the center to the surface at either end. A chimney is improvised at the center by using a barrel and covering its sides with clay; scrap iron can be utilized for building a grate, and stones for lining the sides of the trenches.

The chimney at the intersection renders a draught available from all four directions. Solid garbage is burned by throwing it down the chimney, while the liquid refuse is evaporated by pouring it on the hot stones. See "Hand Book" for rock pile crematory.

Disposal of liquid waste.—Dishwater, bath water, and other waste water should be drained into "soakage pits." Grease and soap soon clog the pit, unless some provision is made for them. This clogging is combated by use of traps.

A urinal soakage pit is constructed as follows: Dig a pit 4 feet square and 4 feet deep, fill up to within 6 inches of the surface with large stones or empty perforated tin cans, and insert four pieces of iron piping $4\frac{1}{2}$ feet long, one at each corner. Cover stones with sacking and fill the rest of the pit with earth. Tin funnels are fitted and inserted into the ends of the iron pipes. This style is extensively used abroad.

Horse litter may be used as fertilizer or be burned.

1. Used as-fertilizer by (a) distribution. This method is applicable only in warm, sunny weather. The manure is spread in a thin

layer on hard, level ground, care being taken not to have more than 1 inch in thickness. It is raked over a few hours later and all small lumps broken up. This rapid drying method prevents fly breeding.

(b) Close packing (bio-thermic method). In this method the manure is moistened with water and closely packed by gradually adding new manure and beating the pile with shovels. The center of the pile undergoes fermentation, and a heat of more than 150° F. is generated. This is sufficient to destroy the eggs and larvæ of flies.

(c) Larval flytrap. The manure is stored on an elevated platform composed of parallel slats, underneath which is placed a receptacle containing water or some insecticide solution. The pile is exposed, thus encouraging flies to lay their eggs. The eggs hatch into maggots, and the maggots burrow through the pile in search of earth, with the result that they fall between the slats into the solution below, where they are destroyed.

(d) Chemicals. Dissolve two-thirds of a pound of borax in 10 gallons of water, using a little over 1 gallon of this solution to each bushel of manure. Powdered helbore is also used in about the same proportions. The efficiency of this method is questionable.

When not used as fertilizer a wire hammock may be improvised and slung between two trees. The requisites are a small amount of heavy wire, a pair of wire clippers, and a little ingenuity. The manure is thrown on and burned. The hammock can be swung with a pendulum-like motion in order to increase the draft, which will facilitate the destruction of the litter. Another method is to place the manure in piles of 2 by 2 feet, known as windrows, sprinkle them with oil and burn.

INSECT CONTROL.

Flies.—Flies breed in manure, human excreta, and decaying organic matter. (See methods of disposal of manure.) The picket line should be burnt over weekly, using crude oil and straw for this purpose.

All galleys should be securely screened. All food should be kept in screened receptacles. Mosquito netting may be utilized to make fly-proof cages to place the food in after preparation.

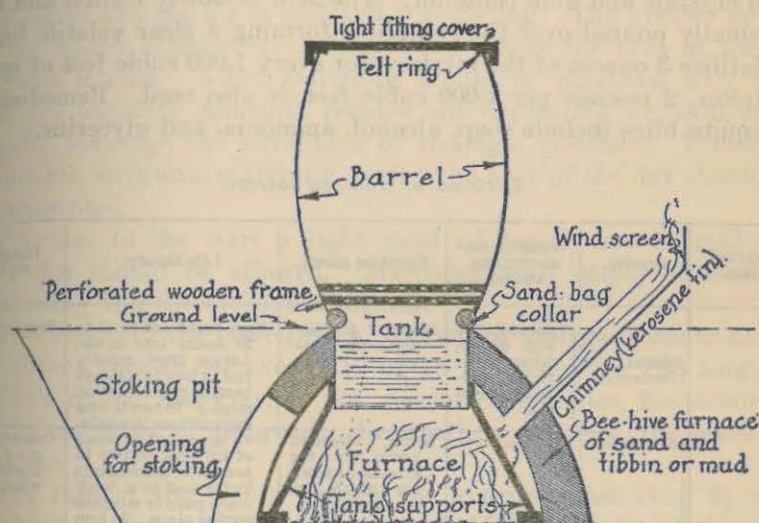
Traps and swatters should be freely used. In daytime flies tend to settle on broad surfaces, but at night they prefer hanging cords, wires, etc. Flies are attracted by the sunlight except on a very warm day when they seek the shade.

Sodium salicylate 1 per cent or formaldehyd one-half of 1 per cent solution (2½ per cent solution of formalin) in milk may be used; also sodium arsenite is recommended. The fumes of gasoline are

fatal to flies. Put the gasoline in a saucer and pass the same under the flies resting on the ceiling, horizontal wires, etc.

Fly-paper "tanglefoot" may be made by heating castor oil, five parts (by weight), and powdered resin, eight parts, until the resin is dissolved. Do not boil. The solution is then applied while hot to glazed paper.

Mosquitoes.—In draining an area, make the drains as few as possible, clean cut, with sloping edges, narrow bottoms, and straight courses. If necessary, laterals may be run into the central ditch, i. e., "fishbone" drainage. Laterals should join the main ditch at an



·CROSS-SECTION·
·SERBIAN-BARREL·

acute angle in order to lessen the deposit of silt and debris. Frequent inspection and constant repair are necessary for the proper maintenance of the ditches.

When it is impossible to drain certain mosquito-breeding areas they may be controlled by oiling, using crude petroleum, about one-half ounce for every 15 square feet. The oil forms a thin layer on the surface of the water, and when the mosquito larva, commonly called a wiggle tail, comes to the surface the oil clogs up the breathing apparatus and kills the larva by asphyxiation.

A larvicide which usually contains carbolic acid has been used in Panama.

Kerosene is extensively used in some tropical countries as a repellent to mosquitoes. Spirits of camphor and oil of pennyroyal will keep away mosquitoes, but their action is not lasting, and a single application will not suffice through the night. One part of citronella and four parts of vaseline is highly recommended.

Mimms's culicide consists of equal parts (by weight) of carbolic acid crystals and gum camphor. The acid is slowly melted and then gradually poured over the camphor, forming a clear volatile liquid. Volatilize 3 ounces of the mixture for every 1,000 cubic feet of space. Sulphur, 2 pounds per 1,000 cubic feet, is also used. Remedies for mosquito bites include soap, alcohol, ammonia, and glycerine.

Division of common insects.

Common name.	Species.	Common diseases transmitted.	Breeding places.	Life history.	Range of flight.
Flies.....	(Musca..... (Domestica.....	(Typhoid; cholera; dysentery; diarrhea; small-pox; erysipelas.	Manure; garbage; decaying matter.	Eggs hatch out in 12 to 24 hours into larvæ. Larvæ grow rapidly and in four to six days become pupæ (resting stage.) In two to four days mature to adults.	Several miles.
	Anopheles..	Malarial fever.	Rural; stagnant pools; among grass and rushes; swamps and marshes.	Ova deposited in mass of 250 eggs; in two to four days, hatched into larvæ and in a week reach pupa or wingless resting stage. In two or three days develop wings and become adult mosquitoes.	One-half mile usually against the wind.
Mosquitoes..	Stegomyia..	Yellow fever..	Domestic; develop in water in any container near a house or in gutters, cisterns, spouts, etc.	Female lays 70 eggs. Larvæ hatch out in two days and develop into pupæ in one week. Then in two or three days become mature adults.	Maximum of 75 feet; usually hide in nooks away from wind.
Lice.....	Pediculus..	Typhus fever; relapsing fever.	Breed and spend their entire life on warm blooded animals, including man.	Eggs cling to hair or clothing of host (man). They hatch out in three to four days and mature in 10 to 15 days.	Do not travel much; keep close to one host.

Lice.—Body lice are concerned in the transmission of *typhus fever*. Various methods are employed in attempt at the eradication of this

parasite. The clothes may be immersed in gasoline or kerosene. N. C. I. powder consists of 96 per cent naphthaline and 2 per cent each of creosote and iodoform. This powder is dusted in the interior of the clothes.

Steam heat kills both the adults and the eggs. The Serbian barrel makes a simple and efficient means of sterilizing the clothes. It will be profitable to study this device in the accompanying sketch, as it is easily made, and is a very useful means of sterilization.

THE MARCH.

Marching is usually a military necessity executed to bring troops into advantageous or strategic positions at or near the battle line. It is therefore necessary to take well-known precautions in order that the men may arrive at their destination in the best physical condition and not completely fatigued. The starting hour is, of course, determined by the existing necessities. Whenever possible, however, it should be in the early morning when the men are fresh and active and the air is cool and stimulating. The greater portion of the march is therefore accomplished before the heat of the day becomes intense. Night marching should be practiced only when military necessity demands, because the depressing physical effects usually outweigh the advantage of strategic positions. Unless unavoidable, strenuous marching during the heat of the day should not be attempted.

Previous to the start a light meal of bread, cereals, milk, tea, or coffee should be allowed. Marching with empty stomachs is weakening and therefore detrimental.

The length of the march for a division or a brigade under normal conditions should not exceed 12 or 15 miles daily. The length of a day's march, however, is not measured by miles, but according to the condition of the roads, the weather, the pace, the loads carried, etc.

The rate of the march should not average more than $2\frac{1}{2}$ miles per hour, inclusive of stops; more than this will lead to fatigue and exhaustion. To average this, 120 30-inch steps a minute are required. The march should be at route order, in open ranks, half on each side of the road. This decreases the heavy, devitalizing cloud of dust, foul odors, water vapor from perspiration, etc., which tends to hang over close-order ranks. The march should end with the same equal pace with which it started; the frequent "final spurt" should not be invoked as, at this stage, it is doubly depressing. The men should alternate between marching in step and at ease; singing and whistling popular tunes is to be encouraged. This distracts their

minds from their fatigued condition, and is probably the surest way of preventing early exhaustion. Straggling, either from poor discipline or fatigue, is always to be avoided, as it is depressing to the "morale" of the entire body of troops.

In hot weather coats should be unbuttoned or removed on the march but replaced at halts. The position of the body should be inclined slightly forward, similarly to the position assumed in mounting a flight of stairs. This is especially to be advised if the soldier is carrying his full equipment. Marching rigidly erect necessitates the expending of greater muscular effort and therefore early fatigue.

Smoking on the march has a depressing effect on the physical condition of the men, particularly upon the heart and lungs. It also has a tendency to cause the mouth to become dry, creating excessive thirst. This practice should be strictly prohibited.

Before the start only the average amount of water to a meal should be ingested and the water bottles filled with water, unsweetened tea, or coffee. Following this, the canteens should not be resorted to until $7\frac{1}{2}$ miles have been covered. The contents should then take the men to the end of the 15-mile march. The bottle should again be refilled at the end of every subsequent mile. The average normal requirements are 1 quart of water at the end of every $7\frac{1}{2}$ miles.

The wise old soldier will march nearly all day with only an occasional recourse to his water bottle and then very sparingly. The young and unwise will drink excessively every few miles, and as a consequence becomes "water-logged," perspires freely, tires easily, and refills his bottle from every strange, perhaps heavily contaminated, stream along the wayside. Water bottles should not be filled at these streams until the quality of water is approved by the medical officer.

A fairly satisfactory method of allaying the thirst while on the march is to suck on a small pebble placed in the mouth, to excite the flow of saliva, at the same time breathing through the nose.

Selection of a camp site.—The following characteristics recommend a site:

1. Accessibility to a supply of good water, fuel, and forage.
2. Sandy loam or gravel soil.
3. Elevated site, well drained, such as a sloping plateau or high river bank.
4. Shade trees as protection from the sun's rays in warm weather.
5. Hills and forests acting as windbreaks in cold weather.
6. Grass.

The following features are unfavorable:

1. Recent use as a camp site.
2. Dry bed of river, ravine, or base of hills.

3. Clay or alluvial soil.

4. Proximity to marshes, swamps, or other areas of mosquito breeding.

At the end of the first 10 minutes, a short halt of a few minutes is advised to enable the compensatory activities of the heart and respiratory organs to adjust themselves to the march, or, in other words, to gain "the second wind." Subsequently halts of 5 or 10 minutes are ordered at the end of each hour and halts of 30 minutes at the one-half or three-quarters point. During these rest periods the men may lie upon their backs, but should replace or rebutton their coats and avoid undue exposure to drafts or winds.

It is necessary to assume a strict regimental sanitary discipline along the line of march. A small detail including a medical officer can be sent ahead to select the suitable camp site or resting haven, to investigate the water supply, and to prepare urine pits and shallow latrines.

Great care and many precautions must be exercised at these cursory halts to prevent the casual fouling and contamination of the surrounding vicinity. A sanitary detail should stand watch over this allotted area to insure proper use and care. When the march is resumed these men should fill the trenches and leave the area clean and wholesome.

Light food may be ingested when two-thirds the distance is covered. The main meal is not served until one-half hour after the day's march is completed.

Care of the feet.—The value of this detail can not be overemphasized. It is said that during the first days of a campaign 10 to 25 per cent of the men are physically disabled from foot troubles. Of course the prevention of the foot injury while marching depends upon properly fitting shoes and socks. The common mistake of the recruit is to call for the same size shoe worn in civil life. With the noticeable difference in the last of the military shoe, especially its width, the man will receive a shoe perhaps three or four sizes too short, and in a few weeks will develop some form of sore feet. To obviate these common mistakes the feet must be measured by an officer, the man must wear his full equipment to cause full expansion of the feet, and the inner surface of the shoe must be a quarter of an inch longer and wider than the foot. It is also essential to keep the feet clean, to prevent abrasions and infections. The feet must be washed daily at the end of the march, clean socks should replace the dirty one, which must be washed and dried overnight. If water is not abundant the feet can be cleaned by wiping them, particularly the toes, with a wet cloth.

It is equally imperative to wear properly fitting socks, small ones will pinch the feet and readily become torn, forming creases; too

large socks very soon fold and crease beneath the feet, bruising and blistering the skin. Torn socks must not be worn while on the march. Repaired socks are also harmful to the feet. It is well to stretch the socks at the end of a day's march. If washing is impossible, change and put them on the opposite feet to the ones on which they were worn the day before.

For tender, sore feet a powder of salicylic acid 3 parts, starch 10 parts, and talcum 87 parts placed within the sock relieves the condition. Rubbing soap or vaseline over the tender area is also useful. Blisters should be pricked with a sterile pin or needle, and the area protected by a small pad. Chafing between the toes is easily cured by cleanliness, a small wedge of cotton separating the toes, and the application of the above foot powder. Corns are treated by salicylic acid ointment or collodion applied nightly after a hot foot bath; usually after four or six applications the corn can easily be removed with a knife. Careful attention to the feet of marching men is as important as the attention bestowed on the rifle, and many foot troubles can be eliminated by the rules described above.

LOCAL TREATMENT OF BURNS AND SCALDS.

By L. C. SIMS, Pharmacist, United States Navy.

Prompt treatment of burns and scalds constitutes one of the most important phases of first aid in the Navy. Not only is a knowledge of what to use and how to use it imperative, but there must be at all times an ample supply of material on hand ready for instant use.

Formerly the routine treatment for extensive burns was the application of carron oil, the linimentum calcis of the pharmacopœia, which consists of equal parts of lime water (liquor calcis) and linseed oil. This old and tried remedy has at least one redeeming feature—it soothes the intense pain of a fresh burn. The objections to its use are many. It is apt to become rancid with age, and when the oil becomes rancid and acid in action it no longer soothes but intensifies the agony of the victim. It is dirty to use and becomes very offensive if left in contact with the burned surface for any length of time. Infection of the burned area is extremely common when carron oil is used. The ingredients are bulky and not always at hand in dispensaries and sick bays.

Picric acid has been the accepted burn dressing in the Navy for several years, and it deserves its wide popularity. It still remains as the choice first-aid dressing for burns, involving a large number of men who must all be given relief in the shortest possible time. The new and more elaborate paraffin film treatment can be applied as a final dressing when time is not the prime factor.

Picric acid (trinitrophenol) is a brilliant yellow crystalline powder of intensely bitter taste. It is explosive when heated rapidly, and hence should be stored remote from fires and in a cool place. It is soluble in 78 parts of water and is used in a saturated solution as a burn dressing, 6.4 grams making 500 mls of solution. The objections to its use are that it stains everything with which it comes in contact a deep, permanent yellow. Being applied in an aqueous solution, it soon dries and hardens the dressing, thus irritating the burn mechanically and causing the dressing to adhere.

The discovery of picric-acid solution as a burn dressing may be of interest here. It is said that a French chemist while working with picric acid noticed that when a lighted cigarette came in contact with his fingers he felt no pain. After a few experiments he found that the phenomenon was due to the picric acid that stained his fingers.

Explosions, conflagrations, and casualties due to escaping steam are apt to occur at any time, and the corpsman should know how to prepare large quantities of picric acid and normal salt solutions, which are perhaps the best first-aid preparations for use by hospital corpsmen in such emergencies. So, remember that it takes 6.4 grams of the picric acid to make a pint of solution or 50 grams to make a gallon. For normal salt use 8.5 grams sodium chloride (common salt) to the quart or 34 grams to the gallon. The normal salt should be maintained at a temperature of about 100 F (37 C.). For burns involving large areas, absorbent cotton is preferable to gauze as a dressing material as it does not become hard when dry.

A covering of oiled muslin over the dressing will be found useful in retaining the moisture and excluding air, which is very important in burn treatment.

For minor burns of the first degree a dressing of soda solution, normal salt solution, or a bland oil or ointment is efficacious. In burns due to acid remember that the acid present on the skin must be neutralized by flushing with a weak alkaline solution, and if from an alkali flush with a weak acid, such as dilute acetic acid or vinegar, then treat as in any other burn. In very severe burns attended by shock immersion of the whole body in normal salt solution at about 100 F. is doubly effective as a stimulant and a pain sedative.

Now we come to the new film treatment by means of a wax or paraffin coating, which has been used so extensively in the present war. The credit for this discovery also belongs to a French physician, Dr. Barthe de Sandfort. The basic principle of the wax film treatment is the formation of a soft pliable covering to replace the destroyed tissues and protect the part from injury and infection. It is a measure of mechanical therapy.

Dr. de Sandfort evolved the wax application as a treatment for an acute joint inflammation from which he suffered, and first used the wax dressing in this connection much the same as we use an antiphlogistine pack for the same purpose. Having obtained excellent results with the wax pack for his rheumatism he tried it on a number of burn cases he was called upon to treat. The results exceeded his expectations and he reported his discovery to other medical men, who at first ridiculed his method. However, with the present war he had ample opportunities to experiment further with his dressing until the world awoke to the fact that another discovery in medicine had been made.

The original preparation of Dr. de Sandfort has been placed on the market as a secret proprietary preparation known as "ambrine." It is known to contain paraffin, eucalyptol, an asphalt body, and amber oil. Many other wax preparations have since been placed

on the market, and some of them appear to be fully equal to the original "ambrine."

The Bureau of Medicine and Surgery has placed one of these wax paraffin preparations on the supply table for issue on requisitions "B" and "4." This preparation comes in the form of a block of wax which is medicated with a "chlorazene" derivative, eucalyptus, and an asphalt body. It is applied very hot (from 120 to 150 F.) directly to the burned surface by means of a spray or camel's-hair brush.

Several devices for spraying the hot wax over the burn have been advocated and placed on the market, but it has been found that these devices are prone to clog when most needed, and as only one treatment can be given at one time with a single spray they are not considered practicable for general use in the Navy. The bureau is issuing a camel's-hair brush about $2\frac{1}{2}$ inches in width for applying the paraffin.

A device for melting the wax and keeping it hot for use is suggested in the Journal of the American Medical Association for June 16, 1917. This consists of an ordinary glue pot in which is placed over a pound of sodium acetate. In this pot another pot containing about a pound of the wax paraffin is placed. When the sodium acetate is melted at a temperature of 138 F. the paraffin will remain for two hours at an ideal usable temperature for use. The sodium acetate can be repeatedly heated without change.

In melting the wax paraffin preliminary to use *see that no water becomes mixed with it*, since even a small amount incorporated in the wax will cause pain when applied to the burned surface. While the wax paraffin is slowly melting, separate the absorbent cotton into very thin layers ready for application. *The burned surface must be dried before the dressing is put on.* If an electric drier is not available, thick pads of warm absorbent cotton should be spread over the wound, which is later fanned with a towel or fan. It is of vital importance to *handle the wounded surfaces very gently* so as not to cause bleeding. As soon as the burned surface is dry, apply the hot wax paraffin. When this is done with a brush, make gentle little dabs rather than strokes. Avoid putting the material on the uninjured skin, but cover in the entire burn. After it cools the wax paraffin solidifies and acquires a glistening appearance. Now spread a very thin pad of absorbent cotton over the wax paraffin. A second coating of wax paraffin is now applied, and then a second layer of absorbent cotton or gauze. The whole dressing is now held in place by a roller bandage. In handling very large burned areas the wax paraffin should be applied a little at a time—to areas about 4 inches square, and they are made continuous, so that the completed dressing is a single one.

In removing the dressing apply dressing scissors with good cutting edges to some part of the dressing where it projects beyond the affected area, scissors coming in contact with the healthy skin. The cut dressing may now be rolled, pressed, and peeled back on each side of the cut and removed without pain.

Burns treated by this method secrete freely and may require to be dressed several times in 24 hours.

RESCUE OF THE DROWNING.

The Surgeon General's annual report for the years 1913 (32), 1914 (42), 1915 (51), show that drowning has caused more deaths in the Navy each year than any other one cause. What the year 1918 will show can not be predicted. It is, however, obvious that drowning is one of the major hazards of the sea and that frequently the hospital corpsman may be called upon to aid in the rescue of a shipmate from this danger.

The rescue of the drowned at sea in times of peace is generally preceded by the cry "Man overboard!" and the officer of the deck must maneuver his ship, lower the lifeboat and release the life buoy with sufficient speed and precision to allow the lifeboat's crew to reach the man before it is too late. On another page will be found a commendation of a chief pharmacist's mate who with a comrade risked his life to save a fellow being from drowning. Not infrequently the husky, athletic hospital corpsman, who is also a good swimmer, has an opportunity to distinguish himself in this way. Frequently he may be the one man in the lifeboat not occupied with the management of the boat and therefore free to go overboard to the rescue.

Of course, theoretically the hospital corpsman should wait for others to rescue the drowning man from the water, so that he may, if possible, resuscitate him when he is finally brought in. But what red-blooded swimmer can be made to wait till a shipmate almost drowns, when immediate rescue in the water may prevent the necessity for resuscitating him later?

The rescue of the apparently drowned is so important that it is considered in several books accessible to hospital corpsmen:

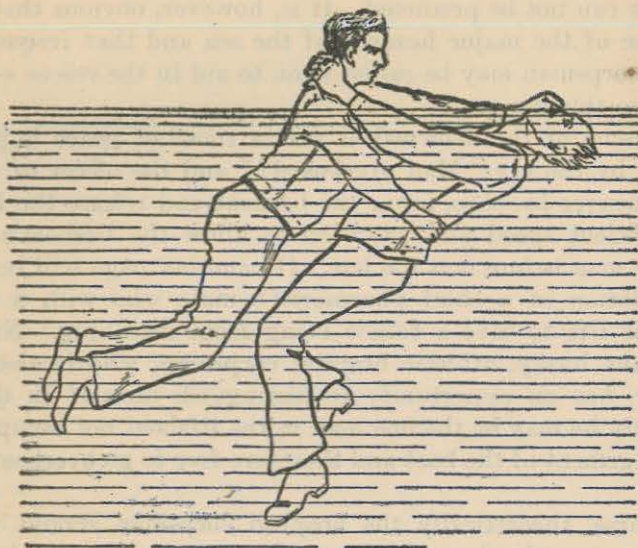
1. The U. S. Naval Instructions, Article I, 2620 (1).
2. The Blue Jackets Manual, pages 197-204.
3. The Manual for the Medical Department, page 69, paragraph 1012.
4. The Hospital Corps Handy Book, pages 28-29.

Article 2620, Naval Instructions, enjoins upon commanding officers the necessity of utilizing every opportunity to instruct men in swimming. Training stations attempt to teach 100 per cent of the apprentice seamen who leave the stations. Commanding officers of ships in tropical waters and in warm weather supplement this teaching so far as is practicable. Every man in the Navy should be a swimmer, and a good one.

The Blue Jacket's Manual deals with the rescue of men in the water and is quoted herewith:

1. If a man has fallen overboard, is struggling in the water, and you go to his assistance, what should you do?

Answer. In approaching drowning persons, swimmers should get their attention and reassure them by calling in a loud voice that assistance is at hand. Approach a drowning person from behind, seize him by the hair if possible, and turn him on his back in front of you, while you yourself assume the same



Breaking the grip.

position in the water, keeping both heads a little above the surface by an occasional kick.

2. What is a so-called death grip?

Answer. The death grip, as shown in the illustrations, is a grip on the rescuer by a person struggling to save himself, and which is likely to endanger both lives if not broken. The death grip is made possible by the rescuer not approaching a drowning person properly. The illustrations show various death grips, and the methods of breaking them. In some cases it is necessary to stop the drowning man's breathing by pinching his nose and closing his mouth with your hand, by putting his head under water, by dealing him a severe blow with your fist, or by striking him with your knee in the pit of the stomach. While these procedures seem brutal, they are justified in order to save life.

3. Having the drowning person under control, how would you proceed with the attempted rescue?

Answer. Persons apparently drowned are suffering not only from the suffocating effects of water, but, usually, from exhaustion caused by struggling, and shock from fright and cold, as well. They should be promptly and gently removed from the water and efforts at resuscitation should be begun instantly.

The Manual for the Medical Department, page 69, paragraph 1012, briefly and clearly gives the method of resuscitation advocated by the medical department of the Navy. The following steps are described:

First. Empty water from patient's lungs.

Second. Get air into his lungs by manual manipulation of the patient (Shäffer).

Third. Keep up efforts steadily, slowly, and gently for at least two hours, unless natural breathing is earlier restored.

Fourth. Have assistant remove wet clothing and apply warm clothing.

Fifth. Watch for several hours to see that patient does not cease breathing.



The ideal rescue, swimming on the back and towing the drowning person.

The Hospital Corps Handy Book (1917), pages 65-67, tells in detail how to resuscitate the apparently drowned. Artificial respiration is there described. This method of manual artificial respiration is applicable not only to drowning but also to electrical shock and to mine gas resuscitation, the only difference being that in drowning it is, of course, essential to precede the artificial respiration by *emptying the water from the patient's lungs*.

Another description of the Schäffer method is contained in a pamphlet entitled "Report of the Committee on Resuscitation from Mine Gases," and is quoted here:

Quickly feel with your finger in the victim's mouth and throat and remove any foreign body (tobacco, false teeth, etc.); then begin artificial respiration at once. Do not stop to loosen the patient's clothing; every moment of delay is serious.

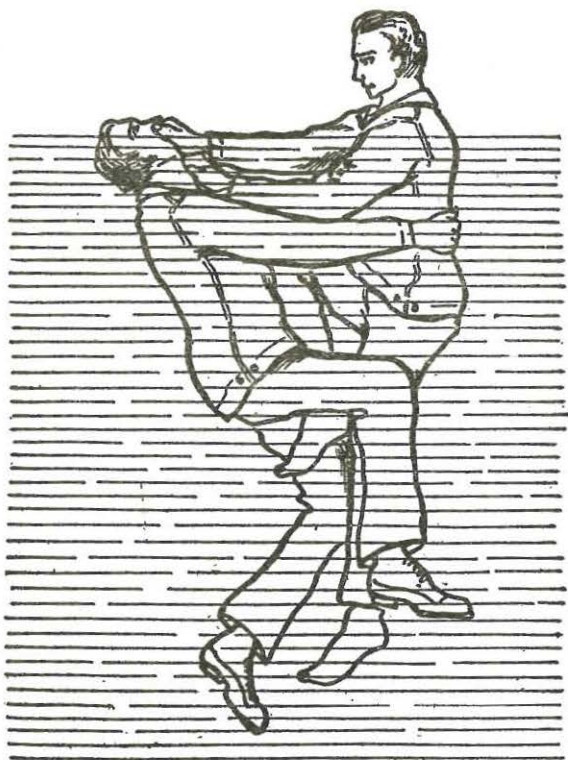
Lay the subject on his belly, with arms extended as straight forward as possible, and with face to one side, so that the nose and mouth are free for breathing. Let an assistant draw forward the subject's tongue.

If possible avoid so laying the subject that any injured places are pressed upon.

Do not permit bystanders to crowd about and shut off fresh air.

Kneel, straddling the subject's thighs and facing his head; rest the palms of your hands on the loins (on the muscles of the small of the back), with thumbs nearly touching each other and with fingers spread over the lowest ribs.

With arms held straight, swing forward slowly so that the weight of your body is gradually brought to bear upon the subject. This operation, which



Breaking the grip.

should take two to three seconds, must not be violent, lest internal organs be injured. The lower part of the chest and also the abdomen are thus compressed and air is forced out of the lungs.

Now, immediately swing backward so as to remove the pressure, but leave your hands in place, thus returning to the first position. Through their elasticity, the chest walls expand and the lungs are thus supplied with fresh air.

After two seconds swing forward again. Thus repeat deliberately 12 to 15 times a minute the double movement of compression and release—a complete respiration in four or five seconds. If a watch or a clock is not visible, follow the natural rate of your own deep breathing, swinging forward with each expiration and backward with each inspiration.

While this is being done an assistant should loosen any tight clothing about the subject's neck, chest, or waist.

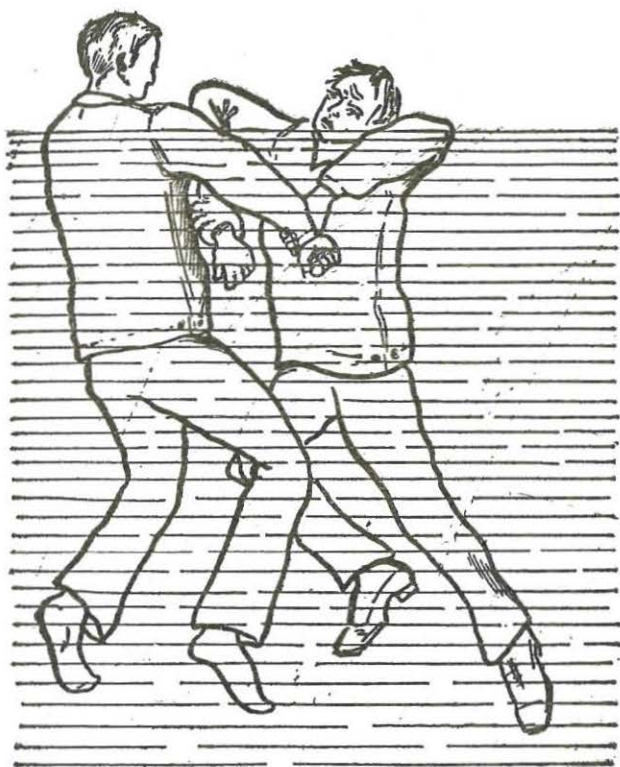
Continue artificial respiration (if necessary) two hours or longer, without interruption, until natural breathing is restored or until a physician arrives.

Even after natural breathing begins, carefully watch that it continues. If it stops, start artificial respiration again.

During the period of operation keep the subject warm by applying a proper covering and by laying beside his body bottles or rubber bags filled with warm (not hot) water. The attention to keeping the subject warm should be given by an assistant or assistants.

Do not give any liquids whatever by mouth until the subject is fully conscious.

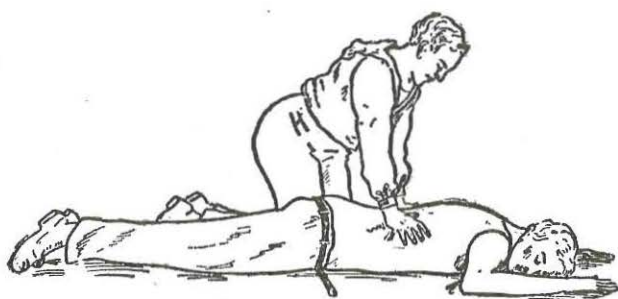
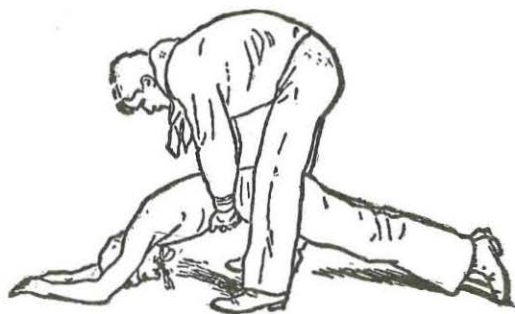
We used to hear of the Silvester method of artificial respiration. This method was originally published by Henry R. Silvester, B. A., M. D., in London in 1858, but is not now considered quite as good as



Breaking the grip.

the newer Schäffer method. Its real disadvantage is that two persons are required for its proper administration, while the Schäffer method can be applied by one person, though more than one is, of course, a help even with this one-man method.

In addition to the manual method for the restoration of breathing there have lately been used certain mechanical devices for the introduction of air, or air and oxygen, into the human chest. These devices have been greatly praised and brought into prominence by their



Resuscitation by the method of Shäffer.

manufacturers, but the general opinion to-day is that they are not of as much use in the average case as are the manual manipulation methods of Silvester and Shäffer.

No time should be wasted in beginning artificial respiration for the resuscitation of the apparently drowned or the apparently dead from gas asphyxiation or from electric shock, and the method of Shäffer is the most easily, quickly, and effectively applied.

The so-called substitutes for the Shäffer method of artificial respiration produce a wonderfully satisfying effect upon the mind of the bystander and a soothing effect upon the relative, comrade, or shipmate who sees the bright nickle and interesting valves and inflating and deflating bags of the very ingenious instrument in operation. The hospital corpsman should never depend upon such mechanical aids unless specifically directed to do so by the medical officer with whom he is working.

The lung motor, the pulmotor, the oxygen inhaler may be an adjunct or an assistant in saving life if used by specially experienced doctors, but it is desired to convey to the hospital corpsman the following advice: If you wish to be effective in the resuscitation of the apparently drowned, depend upon your hands, muscles, and brain in the application of the Shäffer method of artificial respiration after you have emptied the water from the patient's lungs and let the pulmotor, the lung motor, take its proper place, which is second (and a long second), and away behind the all-important manual method of Shäffer.—[Ed.]

THE OPERATING ROOM.

By G. F. COTTLE, Passed Assistant Surgeon, United States Navy.

The ambitious and interested hospital corpsman who desires to add a knowledge of the operating room to his other hospital-corps accomplishments will find in the book called "The Operating Room," by Smith, published by the W. B. Saunders Co., Philadelphia, Pa., 1917, and sold for \$1.50, much of interest and of value. "Principles of Surgical Nursing," issued by the same publishers (1918), is a very handsome volume profusely illustrated and calculated to be of great service to any operating-room assistant.

Proficiency in the operating room can not be acquired by reading about how things are done, but the scope of the work can be considered on paper and in such books as the ones mentioned the multitude of things to be done are well arranged and described.

If every operation, great or small, in the Navy were made a "clinic for the instruction of the hospital corpsmen," there might be more good operating-room assistants in the corps and there might be less excuse for "cussing out" the hospital corpsman because of his ignorance of operating-room technique and ways.

He who seeks the operating room, and what hospital corpsman does not, as an interesting field of endeavor, is not going to find it an easy job or one that can be learned in a few moments. Not every hospital corpsman has that degree of thoroughness, alertness, dependability, attention to detail, carefulness, honesty, and intelligence which are found in the best operating-room man. It is, however, also true that not every hospital corpsman is fortunate enough to have a good opportunity to learn the details of operating-room work.

In no field of hospital-corps work is practice and continued experience so essential to success, and while only practice makes perfect, there are many hospital-corps duties which lead, naturally toward success in this field.

If you are afraid to soil your hands; if you are a "slap-dash" worker, with eyes always on the clock; if your stomach will not allow you to work a moment beyond mealtime, and you feel as though you had been robbed if asked to work during a liberty, keep away from the operating room and its labors. The operating room has its triumphs, and the hospital corpsman is a very important factor in its success, but the wrong kind of a hospital corpsman, the

inattentive or poorly trained man, is a burden and a menace to the safety of a shipmate who through illness or accident is obliged to undergo an operation.

Form B contains a list of surgical supplies used during surgical operations. The Supply Table for the Medical Department gives lists of all instruments contained in the large and small operating cases, cabinets, and various other cases used in the Medical Department of the Navy. Study these lists, familiarize yourself with the names of instruments and apparatus, consulting also the catalogues of surgical supply firms.

The Supplement (October, 1917) told you how to make surgical dressings; make them whenever possible, and whenever another hospital corpsman is making dressings, lend a hand, so that you will come to know them all. Whenever you hear of a new dressing, learn to make it, and practice making it. Become so familiar with making surgical dressings that in an emergency in which a hundred or more persons are suddenly in need of the proper dressings you will know how to quickly and efficiently make and apply any one or all of them.

While the necessity for cleanliness, which is always present in an operating room, is apt to make those responsible for its care keep the room shut up when not in actual use, keep it locked perhaps so that no dirty feet may track in bacteria dust and dirt, still the hospital corpsman who is an aspirant for duty in the operating room can find time to observe the variety of things that the average operating room contains and will have opportunity to help when work is being done there.

Learn, both in theory and in practice, how to "scrub up" properly and how to prepare a patient for immediate operation or to give the preparation needed the night before. (See Hospital Corps Handy Book, pp. 105-106.) Learn how and seek the opportunity to serve as the "dirty" assistant in the operating room. Learn to scrub and polish everything in the operating room—floor, walls, window ledges, electric fixtures, chairs, sterilizers, basins, etc., until every part is so clean that neither dust nor grease can be found and until the few bacteria left would die for the lack of dirt to feed upon.

He who acts as "dirty" assistant in the operating room and there works long and perhaps tedious hours in the preparation of dressings and sterilization of dressings, in cleaning and preparing the room and its contents after an operation, should, in his spare moments, if any exist, familiarize himself with every light switch, fuse, valve, stopcock, faucet, cold coil, water jacket, hot coil, steam jacket, pet cock, foot tread, gauge, spray, soap holder, water pipe, trap, steam fitting, and electric attachment in the room.

Watch and learn where and how the instruments, sutures, needles, gloves, apparatus, linen, etc., are stored. Find out which instruments are used for any common operation, which are sterilized in alcohol, which in bichloride, which by boiling, which by steam under pressure. Learn how to make up solutions of 1-1000 or 1-3000 bichloride solutions, 2 per cent, 5 per cent, or pure carbolic. Learn the dangers of these chemicals, the poisonous effects, and the good and bad qualities of each.

Learn to assist the doctor in scrubbing up by knowing what he wants and in what order you are to supply sterile nailbrush, or orange-wood stick, green soap, alcohol, bichloride, Harrington's solution, or other chemical germicide. Learn the method by which the skin of the patient is prepared for the benzine-iodine, the soap and water, alcohol, bichloride, or other method.

Learn to attend carefully to the linen, how to get blood out of towels, sheets, etc., to count and check every item on its way to or from the laundry, to fold, wrap, pack, and store it. Learn how to sharpen a knife so that the surgeon will not throw it down in disgust because it will not do the work he expects of it. Learn to take apart, to wash, clean, oil, assemble, and put away the instruments. Learn how to wash, dry, powder, repair, and sterilize rubber gloves. Learn how and where to store tourniquets, rubber tissue, drainage tubes, catheters, catgut, kangaroo tendon, chromic, silk-worm gut, silk, linen thread, silver wire, metal skin clips. Learn how to care for the cautery, the rheostat, tonsillectomy snare, urethrotome, cystoscope, Murphy button, Gigli saw, trephine, special clamps, scissors, needle holders, and hypodermic syringes and needles. Learn how to clean, blow up, and use the Kelly pad. Learn how to obtain and have on hand microscopic slides, cover glasses, culture tubes and swabs, specimen dishes, glass tubes, graduates. Learn how to cleanse and stow basins, pans, dishes, buckets, pitchers, flasks, to make and keep in readiness the various sizes of sandbags.

When he has mastered these things the hospital corpsman has begun an acquaintance with the surgical environment, with the room and its contents. He knows where surgical procedures are carried on and has begun to acquire some of the habits that must become second nature to him before he can be trusted within the sterile zone that surrounds the patient who is "under the knife."

Some day when he has gone thus far he will be told to "scrub up"; and having watched and assisted others in the carrying out of the primary step in surgical technique, he prepares his hands, fingers, finger nails, wrists, arms, and elbows with the utmost thoroughness and then puts on a gown, cap, and gloves, and perhaps stands with his hands not touching anything during the entire operation, doing nothing, or perhaps he may be honored by being allowed to hold the

end of a retractor, the other end of which is in the wound. During this stage of his training the hospital corpsman begins to acquire that careful judgment of distances by which he becomes able to always keep his sterilized hands and arms from contact with anything unsterile. He begins to learn to "think with every part of his outer clothing" and hears himself sharply told to rescrub if he makes the slightest error.

While he is becoming sufficiently trained to be considered a safe assistant when scrubbed up he will have opportunity to learn about the operating table, its stirrups, straps, levers; to learn how to work the table. He will have tried upon himself and his fellow hospital corpsmen the various positions in which the patient may be placed on the table—dorsal, kidney, lithotomy, Sims, Trendelenburg; he will have learned various methods of restraining a patient who does not "go under" easily; he will have seen how a patient is transported from bed to stretcher, from stretcher to table, and from table to bed; he will have seen how the patient is changed from dorsal to lithotomy positions and back again; he will know how the patient's arm, back, head, and feet are protected while he is on the operating table.

After all this a day will come when he will find himself intrusted with the duty of getting ready the things which the anaesthetist should have at hand, such as cans of ether, bottles of chloroform, not opened until the moment of operation, because they deteriorate with exposure to light and air, the face mask of metal or that made of towel and paper for the "open" method or the chloroform inhaler for the "drop" method. There may be on hand the various bags, masks, and containers for the gas-ether or gas-ether-oxygen apparatus for anaesthesia, in which event he should know how to turn on the gases and whether the containers are full or where additional containers are stored. On the anaesthetist's table should be placed K-Y or vaseline to protect the patient's face, gauze wipes, sponges, sponge holders, towels, pus basins, mouth gag, tongue clamps, tongue sutures, and needles, pad, pencil, watch, blood-pressure apparatus, and stimulant tray. On the stimulant tray he should have ready for instant use sterile water, tablets of morphine, atropine, strychnine, digitalin, and a bottle of adrenalin and capsules of camphor, and close at hand the necessary materials and appliances for the giving of a saline infusion.

After days spent in cleaning, working, studying in the environment of the operating room the hospital corpsman who has been found worthy of the trust will some day be allowed to sterilize the dressings and the material which require sterilization by steam under pressure. (See SUPPLEMENT for January, 1918, "Sterilization v. Infection" and the article on the "Autoclav.")

When he can be trusted with, perhaps, the most important link in the chain of asepsis he is almost ready to be called a good operating-room assistant. He can not be said to be a first-rate operating-room man until in addition to all his other abilities he can safely prepare the room right up to the moment of operation.

The first-class man in the operating room who can do this has succeeded, and we see this sort of a man in charge of the operating room and its technique, a highly responsible position and one which few hospital corpsmen can hope to attain unless good fortune has so ordered that long experience and careful instruction have combined to bring about the result.

When fully trained in the operating room we see the hospital corpsman in a position to obey such an order as this: Prepare for abdominal operation, as follows:

1. Sterilization of dressings, etc., in the autoclav.
2. Lay out instruments, sutures, knives, gloves, etc.
3. Place gloves and other rubber material and the glass tubes of catgut under 1-1,000 bichloride solution for an hour, or boil.
4. Place instruments, except knives, in instrument sterilizer and boil in borax solution, 2 per cent, for 15 or 20 minutes.
5. Immerse sharpened and cleaned knives in "pure carbolic" with alcohol at hand.
6. Call in "dirty" hospital corpsman to help.
7. Scrub up and have "dirty" hospital corpsman open sterilizer and hand out the sterile contents.
8. After donning cap, gloves, etc., lay out sterile dressings, towels, instruments, open tubes of catgut and cut in necessary lengths for ligatures, sutures, and thread silk or silkworm gut on needles.
9. When the patient comes in hand all sterilized articles to the surgeon and never break the "aseptic chain," for upon this chain hangs the patient's life and the success of the operation in just the same degree as it does upon the mechanical skill or judgment of the surgeon.

The hospital corpsman who is master of such an operating room technique is rare but he should become less rare. More men of this type are needed; men who during an operation can be depended upon for their surgical aseptic technique, for their knowledge of what is needed at any step in the operation, who can retract with intelligence or direct the "dirty" hospital corpsman in a low and sure tone, who during the operation whether at sea or behind the trenches are quiet, sure, steady, accurate, calm, collected, resourceful, and thoroughly trained in operating technique.

THE CONTAGIOUS CASE.

By J. S. TAYLOR, Medical Inspector, United States Navy.

The contagious case is always a cause for anxiety and frequently the source of serious trouble. As many contagious diseases are most likely to be passed on to others during the early part of their course, it is of vital importance to discover them as soon as possible. Unfortunately, contagious cases often exist for several days, or even longer, before the proper steps are taken to protect those who are well, because (1) these patients frequently do not report promptly to the doctor, because (2) a correct diagnosis is not always made when they are first seen. Measles, for example, begin with a sharp cold in the head which makes the eyes and nose run freely. During the autumn and winter months, when colds are common, the patient with measles may not think that there is anything serious the matter until an eruption appears. In the same way when the attendance at sick call is composed largely of men who are sneezing and coughing and mopping their noses, the doctor may miss a case of measles which is still in the early stage of development.

Two things are essential for the prompt recognition of a contagious case. One must have some knowledge of the characteristic features of the different types, and one must be constantly on the lookout for contagious cases. Acquire the habit of asking yourself whenever you see for the first time a case of acute illness: "Might it be contagious?"

We have much to learn about the exact cause of contagious and infectious diseases and about their mode of spreading, but we do know that in many of them the secretions of nose and throat are dangerous. A man who coughs and sneezes is like a soldier with a machine gun, and the danger zone is represented by the distance to which these discharges can be thrown. The spitter is like the soldier throwing bombs to which time fuses are attached. The urine and stools of certain patients contain the germs of disease, and as the sick naturally soil their hands at urinal and toilet, or when coughing or sneezing or blowing their noses on a handkerchief, and as they leave saliva on the edge of drinking cups and glasses, on thermometers, spoons, knives, and forks, pipes, cigarettes, and the draw string of bags of Bull Durham, there is room for constant watchfulness on the part of the hospital corpsman who is trying to reduce the spread of disease. Mosquitoes, flies, rats, fleas, and bedbugs, and perhaps cockroaches and other forms of animal life play a part in spreading disease, so attention to general cleanliness is of the utmost importance.

If a man comes to the sick bay with eyes and nose running freely and coughing hard, whether he has a flushed and pimply face or not, or if he has a bad sore throat and hoarseness, he is an object of suspicion. Look at his health record, and, if under the heading "Former diseases" there is no allusion to measles, scarlet fever, or diphtheria, and if the patient says that he has never had any of these diseases, and more especially if he is a young recruit or has recently joined the ship, lead him off to one side and take his temperature, pulse, and respiration. While so engaged, look him over and try to decide from his manner and appearance if he has anything more than a common cold and scrutinize his face, neck, and chest. If he is really ill he will have fever. Examine his throat for the grayish spots or membrane of diphtheria, and look carefully over the whole lining of the mouth for the little bluish-white spots which are almost always present in measles before the eruption on the skin. A man with fever, severe sore throat, and a brilliant flush on face, neck, and chest is a scarlet-fever suspect.

If anything has been discovered in the course of this rapid but careful survey, supplemented by a few judicious questions such as "Have you headache or backache?" "Have you had a chill?" "Have you vomited or fainted?" keep him to himself in a remote corner of the sick bay, or if the contagious ward is unoccupied put him there until the doctor comes, and watch him to see that while waiting for further examination he does not go over and talk to some acquaintance in a bunk, or sneak up on deck. If he is in dispensary or sick bay, have him sit with his face to the bulkhead and his back turned to the other people in the compartment. Give him a piece of gauze for his nose and a spit kid, and remember that the thermometer you used on him must be laid in a tray containing alcohol, that the gauze must be burned, the spit kid disinfected with crude carbolic. If he has had a drink of water or a dose of aromatic spirits of ammonia, the glass or spoon used should be immersed in formaldehyde or carbolic solution immediately.

Having recognized the case as clearly contagious it is well to stand guard over him while you send for the doctor. If there is no doctor on the ship, notify the senior member of the Hospital Corps and stand by for orders. If you are the senior man, direct a fellow hospital corpsman to get a place ready for the patient, or let him relieve you on guard and make the needed preparations yourself. This strict surveillance at the outset is of the first importance because, as already stated, the early stage is so often the most contagious stage, and because the patient, foreseeing a period of isolation and loneliness is almost sure to want to get on deck to attend to some matter of private business before being put to bed or, if very young, may entertain the vain hope of escaping your clutches.

There should be no parade about all this. Act quietly and naturally. Do not advertise the concern that you may feel and avoid all unnecessary movement from one place to another on the part of yourself and patient. If you have an empty contagious ward, take the man to it and lock him in, but do not fail to tell some member of the Hospital Corps and the master at arms that you have done so, even though you expect to return to him in five minutes. If there is no other place available for the care of the case, put the patient where you think he can do the least harm, and provide him at once with drinking glass, sputum cup, urinal, closed stool, towel, gauze handkerchiefs, etc., for his exclusive use and give directions to prevent any of these articles being used by others or removed except to be emptied and disinfected. If you have to put him in the general sick quarters he should be in a bunk away from others, and you should endeavor to isolate him when turned in by putting up a screen or hanging a sheet between him and the other patients and rope off his part of the sick bay. Put up near him a neat sign reading: **KEEP AWAY; CONTAGIOUS.**

The case should now be reported to executive and commanding officers. This will be done by the medical officer if there is one, and he will give directions about all details of management. Should he fail to give you specific directions, ask for them and write them down.

As the patient undresses, collect all his clothes, tie them up and keep them near his bunk or in the contagious ward until disinfection of them is arranged for. His watch, money, papers and the other contents of his pockets should be put into an envelope without touching the outside of it. It is then sealed and turned over to the medical officer or executive officer. In turning over the patient's effects to an enlisted man, it may be prudent to do so in the presence of a witness.

Do not touch the patient more than is absolutely necessary, and wash your hands thoroughly after each contact before going to meals or taking a smoke, in fact, before doing anything for yourself or for other patients. Keep your clothes from touching the contagious patient. Make him hold his hand over his nose and mouth when he coughs, and if he is not alone make him turn his head away from everybody when so doing. Caution him not to spit on the deck and not to throw soiled handkerchiefs or cloths about.

All discharges from the body of a contagious case should be kept in contact with crude carbolic, strong bichlorid or chlorinated lime solution for one to two hours before they are thrown into the water-closet. The containers used should then be washed with boiling water, if possible, rinsed out with antiseptics, and sunned and aired.

The corpsman who attends a contagious case should have hair closely trimmed and be shy of mustache or beard. As such cases

come without warning or time for elaborate preparation, all hospital corpsmen should *habitually* have smooth-shaven faces and keep their hair short. When nursing a contagious case clean the teeth three times a day and rinse out the mouth with a mild nonirritating wash, such as Dobell's or borax solution, and get on deck daily for fresh air and exercise.

In general a contagious case should be nursed by one attendant or one set of attendants specially instructed about keeping clothes and hands clean and reducing to a minimum the contact with other persons, whether sick or well. Gowns should be worn when on duty with the patient and left in the contagious ward or behind the isolating screen when going off duty or temporarily leaving the patient's vicinity. To remove the gown when going off duty or leaving the compartment, wash the hands thoroughly, and then take hold of the gown from the inside, the side that has not touched the patient or his belongings, and peel it off so as to fold the exposed surfaces on themselves. Now wash the hands again. It is necessary, therefore, to provide washbowl, soap, nailbrush, antiseptic solutions, etc., and have them at hand near the patient, from the beginning.

When a hospital corpsman is not sure but thinks a case may be contagious he should play safe. Without making the patient feel like a leper or spreading unnecessary alarm among the chance bystanders, the attendant can, by the employment of a little tact, keep the suspect isolated and under observation until a decision is reached. While showing due regard to the patient's feelings, he must be fully sensible of his own responsibility and of the rights of other members of the crew to protection from danger.

When a hospital corpsman suspects the presence of a contagious case on the ship and such a one has not reported for treatment and is still at large among the crew, he should report his name and rating and the facts to the doctor, or, if he be alone in the medical department, he should ask the executive officer to have the suspect sent to the sick bay for examination.

In conclusion it must be admitted, that in many cases our present methods for controlling the spread of contagious diseases are very unsatisfactory. While we should follow conscientiously the practices now prescribed, something better is to be hoped for in the future.

As stated in the beginning, the failure to prevent epidemics is due to the difficulty of isolating cases from the start and of *isolating also the persons who have been in contact with them during the early unrecognized stage of the disease*. The ideal would be to quarantine or isolate more people and shorten the detention of the discovered case.

If, for example, a case of measles develops in a camp, all the persons who have been in contact with it should be rigidly quarantined.

On board ship this would be difficult, but it is perfectly possible to find out what compartment the man occupied, what mess table he sat at, what gun's crew or watch he belonged to, and so obtain a list of the majority of the persons exposed. These men should be required to report to the sick bay for examination twice a day, but not at the hour for sick call. Have them strip to the waist and look for eruption on the body or in the mouth at the daylight examination. Take temperatures at the evening examination. If weather and other circumstances permit, these examinations might be made in the open air on deck.

A rash, eruption, or "breaking out" may be located on the skin or on the mucous membranes, such as the coverings of tongue, soft palate, pharynx, and lining of the cheeks, or both on skin and mucous membranes.

When a rash is due to drug poisoning (as in the case of quinine, sandalwood, copaiba, belladonna, etc.) fever is not common.

A rash may consist of small pimplelike elevations (papules), of changes in color of the skin (red, rose, purple, or yellow spots, etc.), of papules which are infected (pustules), of blisters containing either clear serum or purulent matter (vesicles, blebs, bullæ according to size), of scales, or of raw, weeping surfaces. Several of these forms of eruption may exist together in a single case. Their significance rests on the grouping and arrangement, the situation where they are found, their number and duration, the time and order of their appearance, and on the accompanying symptoms.

The term rash is a vague term and merely to report that a man has a rash tells very little. His papules may be due to acne or flea-bites, the black spots may be blackheads, the pink spots may mean an attack of indigestion, but *every rash is important until it has been studied and proved innocent*. A rash accompanied by fever and other symptoms nearly always means an acute infectious or contagious disease and should be regarded by those having to do with the sick as a danger signal. Long experience may be necessary in order to diagnose the different eruptions, but there is no field of nursing in which the careful observation and reporting of details is so much appreciated by the doctor, for a rash often changes in the course of a few hours. It is important to know where it was first seen, where it next appeared, whether the spots were sharply marked or faded imperceptibly into healthy skin, whether the elevations were capped with pus, or dry, etc. Some eruptions are easy to diagnose, but in the great majority of cases their nature and importance can only be determined by a careful consideration of every detail.¹

¹ In connection with this article read the Handy Book, pp 116 to 119 and 156 to 179, and the Manual of the Medical Department, chap. 15.—Ed.

THE "AMERICAN" DRESSING STERILIZER.¹

There are a number of devices for the application of steam as a sterilizing agent, but many have failed to observe a most important consideration, viz., the steam must be in motion. The sterilizer that provides for a constant flow of steam during the exposure more nearly approaches the ideal apparatus.

The "American" dressing sterilizer was designed with the purpose of comprehending the complete application of the theory of "steam sterilization" in a simple and mechanically correct apparatus. How well and simply these principles are applied will be apparent in following the explanatory figures and text.

FIGURE 1.

- | | |
|--|--|
| a. Operating valve (3-way). | n. Vacuum breaker. |
| b. Air cock to jacket. | p. Handwheel nut. |
| c. Water valve. | q. Handwheel. |
| d. Gauge glass. | r. Socket plate. |
| e. Gas burner. | s. Safety stop. |
| f. Gas cock. | t. Door. |
| h. Return valve. | u. Levers. |
| j. Steam valve. | v. Pressure and vacuum gauge on inner chamber. |
| k. Steam coil. | w. Pressure gauge on jacket. |
| l. Air and drain valve on inner chamber. | x. Safety valve. |
| m. Exhaust nozzle. | |

Generally described, the "American" dressing sterilizer is a closed vessel in which articles may be exposed and sterilized by the action of steam under a pressure ranging from 15 pounds (250 F) to 25 pounds (265 F) with direct means for generating this pressure, maintaining an even temperature by circulating steam through a jacket, completely surrounding the sterilizing chamber except at the door, creating a partial vacuum and admitting steam into the sterilizing chamber in constant successive waves throughout the full diameter and length from back to front.

The construction provides for an inner and outer shell, the space between representing the jacket. The steam generator, or regenerator, is suspended from and in direct communication with the jacket, and, while it is a separate fixture, it is in fact a continu-

¹ Several manufacturers of dressing sterilizers were asked to send a brief description of the autoclav, for the information of the Hospital Corps. The information submitted by them was utilized in an article written for the first issue of the SUPPLEMENT, entitled "Sterilization v. Infection." A detailed description of the American sterilizer, with four cuts, was submitted by the American Sterilizer Co., which they have kindly permitted us to use in this issue. One can never learn to use the sterilizer by reading only, but it is hoped that this article will be of value to hospital corpsmen who are learning to use this most important instrument.

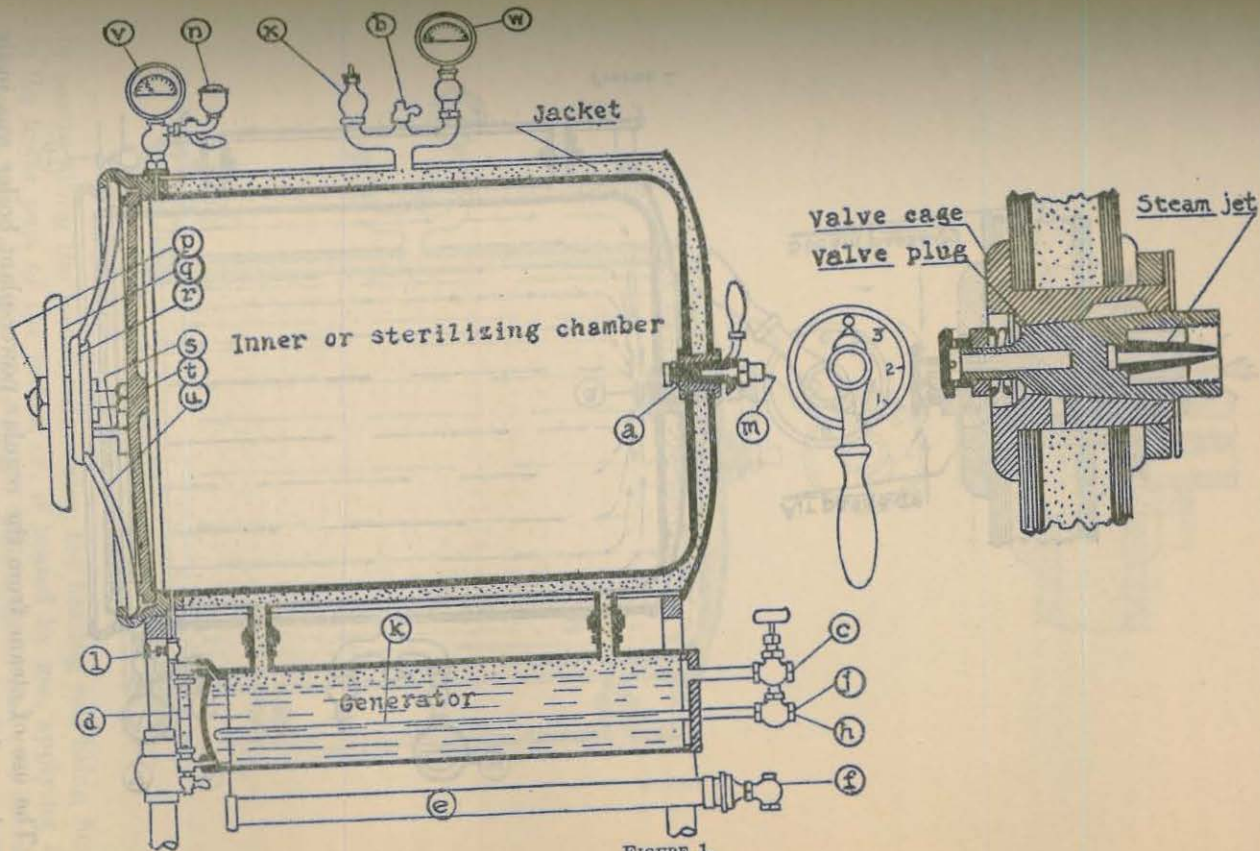


FIGURE 1.

ation of the jacket enlarged to carry a quantity of water and a heating element. Most simple in construction, the functions are highly important.

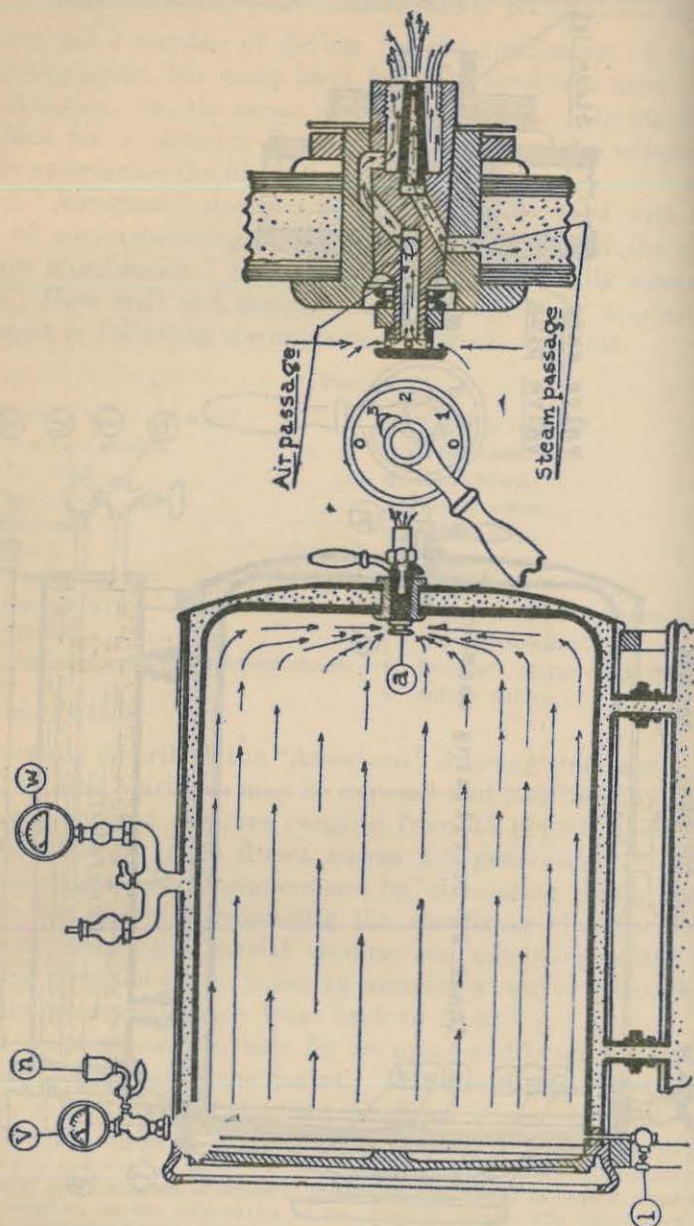


FIGURE 2.

The use of steam from the regular power-plant boiler was justly condemned because the foreign matter with which it is laden—iron rust, boiler compound, oil, etc., has a deteriorating effect upon the

gauze and dressings thus directly exposed. Regeneration of the steam within the sterilizer therefore became a necessity. Formerly, and still, in some types of dressing sterilizers, this was accomplished

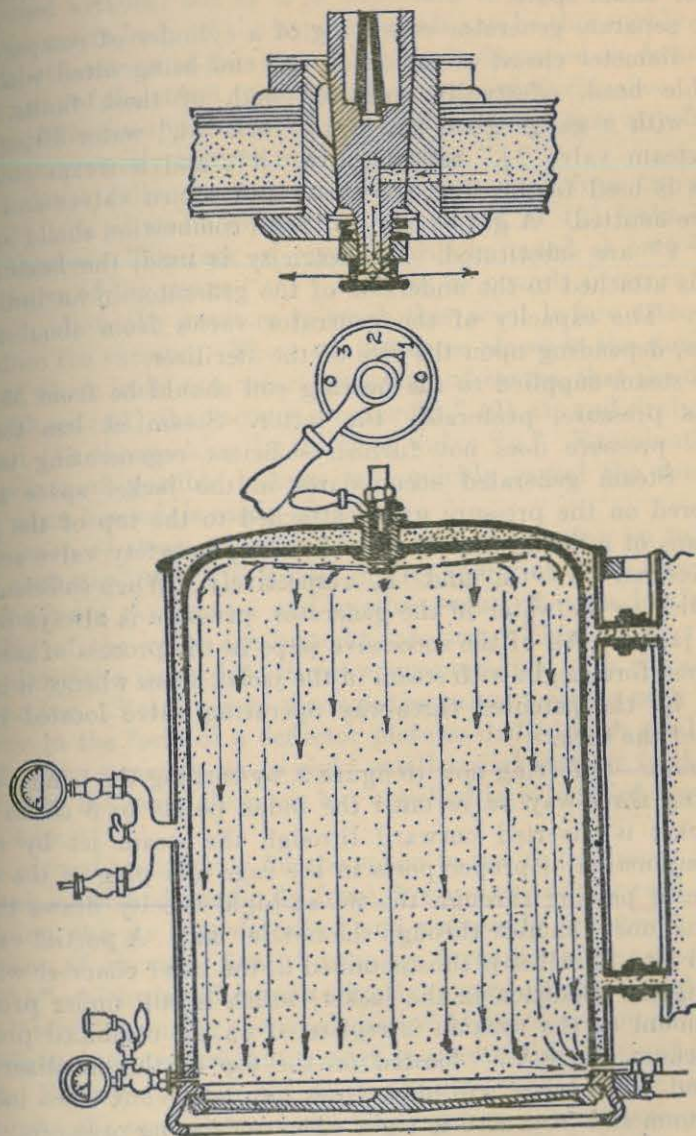


FIGURE 3.

by partly filling the jacket with water, the heating coil being fitted in the lower part of the jacket, or, if heated by gas, applying the gas to the bottom of the outer shell. This method had two decided disadvantages: First, there was an unnecessarily large amount of

water to be heated and, second, the presence of water in the jacket defeated the object of the jacket because of the unequal temperature in the lower portion blanketed with the water and the upper portion, or steam space.

The separate generator consisting of a cylinder of comparatively small diameter closed at each end, one end being fitted with a removable head, effectually corrected both of these faults. It is fitted with a gauge glass and drain cock "d," water-filling valve "c," steam valve "j," return valve "h", and a steam coil "k." If gas is used for heating, the steam and return valves and steam coil are omitted. A gas burner "e" with combustion shield and gas cock "f" are substituted. If electricity is used, the heating element is attached to the underside of the generator in an individual casing. The capacity of the generator varies from about 2 to 6 gallons, depending upon the size of the sterilizer.

The steam supplied to the heating coil should be from 35 to 60 pounds pressure, preferably the latter. Steam at less than 35 pounds pressure does not furnish sufficient regenerating temperature. Steam generated accumulates in the jacket space and is registered on the pressure gauge attached to the top of the jacket by means of a fitting that also carries the pop-safety valve and air-cock, lettered "w," "x," and "b," respectively. When sufficient heat is applied to the water in the generator, pressure is always present in the jacket. All of the successive steps in the process of sterilization, therefore, begin with steam in the jacket from whence it is controlled by the patented three-way operating valve located in the center of the back.

Vacuum.—Referring now to figure 2, by turning the handle of the operating three-way valve until the index points to 3 steam from the jacket is diverted outward through the steam jet by reason of a conjunction of proper ports in the cage and plug of the valve. The steam passing through the jet at high velocity draws the air from the inner chamber through the nozzle "m." A partial vacuum of from 8 to 12 inches is thus obtained in the inner chamber without changing the condition in the jacket, which is still under pressure. The amount of the vacuum is registered on the combined pressure and vacuum gauge "v" located on the top of the sterilizer near front end. The arrow will move from zero to the left when indicating vacuum and from zero to right when registering pressure. With the initial steam pressure as recorded on the pressure gauge on the jacket "w," 20 to 25 pounds, the desired vacuum should be secured in from 30 to 60 seconds, and as the vacuum depends upon the velocity of the escaping steam it is obvious that higher steam pressure insures a more rapid result.

The partial vacuum is a highly important step in the process of sterilization, accelerating the movement of the steam which immediately follows and reducing the amount of initial condensation upon the exposed articles; but as it is important to expel all of the air before the entire body of the exposed goods can be thoroughly penetrated what becomes of this remaining air is discussed in describing the entrance of the steam to the inner or sterilizing chamber.

So simple is the application of the vacuum device that any failure to function properly is most easily corrected.

For instance, failure to secure a vacuum can result from two causes only; (1) lack of steam pressure in the jacket, or (2) leaks in the inner chamber. The lack of pressure will be noted at once by an examination of the gauge "w." If 20 to 25 pounds pressure is not indicated, allow the pressure to reach this point before attempting to produce the vacuum. There are but three places in the sterilizing chamber where leaks can occur, assuming, of course, that the door is tightly closed; (1) the vacuum breaker "n," (2) air and drain valve "l," and (3) the packing in the back valve "a." Examination of these points of possible leakage will quickly reveal the condition which, when located, is easily remedied.

Admission of steam to sterilizing chamber.—Passing on to figure 3, the next step, turn the handle of the operating three-way valve until the index points to 1 and another series of ports in the cage and plug of the valve are brought into use. This conjunction of ports places the jacket into direct communication with the sterilizing chamber. Steam passes through the valve, meeting with an obstruction in the form of a deflector plate so drilled with small holes to deflect the steam in six to eight small radial streams to the back and wall of the inner chamber, but impelled in a forward movement to the door.

The natural tendency is for the steam to rise to the upper portion of the chamber and gradually force downward and forward the air remaining, the air thus described and previously referred to in the treatment of vacuum, finally escaping through the air and drain valve "l," which should remain slightly opened (or be opened at frequent intervals) during the whole period of exposure, not sufficiently to dissipate the pressure, but enough to permit the escape of condensation. For the exposure the steam pressure should not be less than 15 pounds, the equivalent of 250 F., even better results are obtained with 20-pound pressure, about 260 F. The length of exposure should be at least 30 minutes without considerable variation of the pressure.

Failure to maintain the pressure may be traced to two common causes, therefore, easy to locate and correct. There may be leakage in the jacket or chamber or an obstruction in the steam supply to the heating coil if operated by steam, in the gas supply if by gas, or in

the heating element if by electricity. Assuming that the door is tightly closed, leaks might occur in two places, the safety valve and the back valve packing. The safety valve should be set to pop

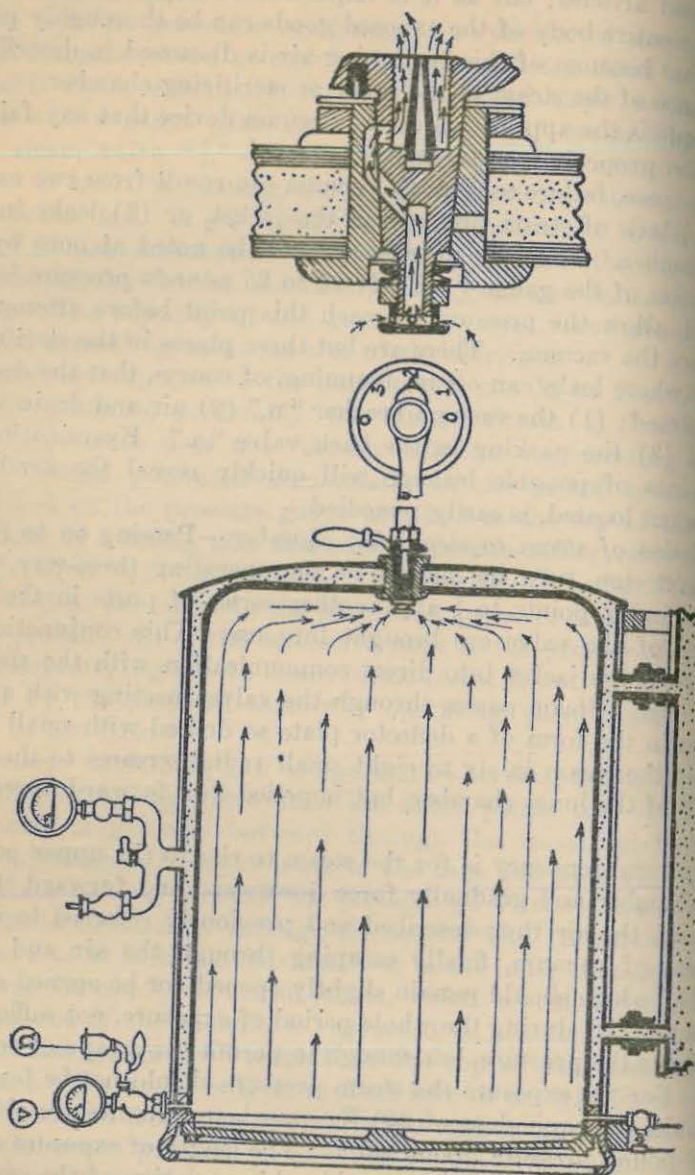


FIGURE 4.

at about 3 pounds higher than the pressure used for the exposure. If 20 pounds is used, set the safety at 23 pounds. Do this by loosening the lock nut and screwing the adjusting nut in the top of the

valve downward to raise the pressure or upward to lower it. A leak in the back valve is usually apparent from the outside and detected by the blowing of the steam. Correct this condition by screwing the circular slotted nut fitted against the head by means of the spanner wrench furnished for this purpose or by renewal of packing if necessary. If no leaks are apparent, examine the heat supply. Interruption of the steam to the coils may be caused by a number of conditions, but the common causes are lack of boiler pressure and backing up of the returns. There must be at least 35 pounds supplied to the coils. A good way to have this under observation is to have a pressure gauge installed in the supply line just before connection is made to the steam valve "j." Anyone familiar with the local piping conditions can locate a possible obstruction in the return line—possibly a steam trap is not working properly.

Release of pressure and final vacuum.—After the full exposure, the condition shown in figure 4 is the next operation.

Turn the handle of the operating three-way valve until the index points to 2. The posts thus placed in conjunction permit the escape of the steam from the inner chamber straight through the valve to the atmosphere, but not impelled by a jet as in figure 2. After the exposure this operation should take place and when the gauge "v" shows no pressure the handle of the operating valve is moved to point 3 for the final vacuum. The final vacuum may be held for a few minutes or may be broken slowly by opening the vacuum breaker "n." The operation is now completed and contents ready for removal and use.

Wetting the exposed goods.—The articles exposed should not be wet when removed or at any time during the exposure, and will not be, under normal conditions. The steam is moist, but not to the point of saturation. To the feel, the goods may seem damp, but the moment they come into contact with the air they are found to be perfectly dry. Naturally, any of the goods coming into contact with the door will absorb the drops of condensation which form on this unjacketed surface, but this can be avoided by proper packing of contents in chamber. The jacket, being under pressure while the vacuum is still in the inner chamber, really makes a highly efficient drying oven which will take up what moisture may be present. Investigate at once if your goods come out wet.

Packing the sterilizer.—One must keep in mind that the goods must be subject to complete penetration of the steam, and without the use of pressure it is hardly possible to pack so tightly that the steam can not penetrate, but if packed tightly it will take a much longer time and a longer exposure than 30 minutes should be given. It will also require a longer time to produce the vacuum. One must use judgment

in regulating the length of the exposure to the character and density of the goods being treated.

Care of the sterilizer.—With ordinary care the "American" dressing sterilizer should give efficient service for a lifetime.

The time to correct a trouble is at its first appearance.

Never permit a valve to continue to leak.—Keep the back valve tight by using the spanner wrench when needed. When not in use the door should be slightly open off the gasket. Use graphite on the face of the gasket frequently. If using gas or electricity for generating the steam, *never apply the heat until water shows about half an inch from the top of the gauge glass. Always keep the water in the glass in sight.* Be sure that the pipe leading from the nozzle "m" drains away from the sterilizer.

ADVICE TO HOSPITAL CORPSMEN.

Assistant Surgeon (T.) C. E. ALEXANDER, United States Navy.
Pharmacist J. HOLDEN, United States Navy.
Pharmacist E. L. SLEETH, United States Navy.
Pharmacist (T.) J. F. MAHNEKE, United States Navy.
Pharmacist (T.) R. J. CASEY, United States Navy.

WRITE NAMES IN FULL, IN A LEGIBLE MANNER, WHENEVER YOU HAVE
OCCASION TO USE THEM.

If it is possible to emphasize more strongly the importance of reporting the names of individuals *in full* and their ratings, the Bureau would like to do so. It is extremely embarrassing to continually receive general correspondence, health records, and reports and returns of all kinds with simply the surnames and initials when there is room to give the names in full. The Bureau's files, for individuals, are kept by the surname, subdivided by the Christian name or names, and the receipt of a paper with the surname and initials only very often creates a new file for an individual who already has a designation. As far as possible every effort is made to properly locate and file each paper or record received, no matter what its nature, because at some future period, and perchance you yourself may be concerned, it may be necessary to use such correspondence or record for legal or pension purposes, and when we go to the files and find that it is not in the jacket, we have to report that "the paper in question is not on file," although the individual could honestly swear that he saw the paper or record prepared and all who handled it will testify that it was sent.

A health record that is not properly closed on the "Termination Page" should not be sent to the Bureau without a letter of explanation as to why it is sent, and no sheet from a health record should ever be detached and forwarded without first seeing that the name of the individual is fully inscribed upon it, so that the Bureau can unquestionably read the name and properly file it.

REPORTS AND RETURNS TO BE SENT.

Reports and returns that are required at stated intervals should be sent promptly. There may be nothing to report on the subject of the form, but the Bureau has no knowledge of this fact. Hence, the need of sending it, and the receipt of a form or report without in-

formation on it at least informs the Bureau that it has not been forgotten, overlooked, or lost in the mails and saves a request at a later date. Particular attention is called to Report of operations (form P) and Recruiting statistics (form X) in this respect.

C. E. A.

FORM F CARD.

It will, no doubt, be interesting to all members of the Hospital Corps to know why the Bureau demands the daily forwarding of this report, and why this card has superseded forms F and K in importance to the Bureau. Approximately 900 form F cards are received in the Bureau daily from the general service. These cards are immediately reviewed in the statistical department for errors and omissions and passed to the sanitary division, where the cards are reviewed with special reference to contagious and infectious diseases. The sanitary division prepares daily and weekly reports which show the incidence of contagious and infectious diseases throughout the service and maintains a series of wall charts which indicate at a glance the prevalence of these diseases at the various shore stations and on board the ships of the fleet. By means of these reports and charts it is possible to trace the origin of an outbreak of a contagious or infectious disease to its source and enable the Bureau to keep in touch, at all times, with the actual conditions in the field. From the sanitary division the form F cards revert back to the statistical department, where a number of machines specially devised for the purpose are constantly at work tabulating data from the cards for statistical and historical purposes, the tables eventually being published to the service in the annual report of the Surgeon General of the Navy.

All data called for on the form F card are tabulated in the Bureau, and hence the great importance of preparing these cards strictly in accordance with instructions and of the extreme care that all hospital corpsmen should take to guard against errors and omissions. The work of the Bureau is seriously handicapped by carelessness in the preparation of form F cards and unnecessary delay in forwarding completed cards. For this reason it is desirable that all hospital corpsmen observe the following:

1. Familiarize yourself with the "instructions" on the reverse side of form F cards.
2. Study the "Nomenclature of Diseases and Injuries" and the "general instructions for blank forms (Personnel)" on pages 2 to 8.
3. Observe the provisions of the following bureau's circular letters: No. 120181, of January 4, 1915; No. 127465, of August 5, 1916;

No. 127644, of April 30, 1917; No. 127465-2, of June 25, 1917; No. 125802, of November 27, 1917.

(NOTE.—Copies of the above Bureau's circular letters can be obtained on request to the Bureau.)

4. Review each form F card for errors and omissions as soon as completed and forward promptly to the Bureau.

J. H.

TYPEWRITING.

Bureau of Navigation's Annual Circular, 1918, page 11, paragraph 45, states:

When a board of medical officers has favorably recommended the advancement of a hospital corpsman to the rate of pharmacist's mate, first class, or chief pharmacist's mate (acting or permanent), the commanding officer shall forward to the Bureau of Medicine and Surgery, in addition to the form N. M. S. H. C., marked in all subjects, the following papers: Evidence of the work the candidate was required to do in his practical examination * * * a specimen of and a statement as to the proficiency in typewriting, etc.

In order to be able to comply with the above every member of the hospital corps should, as occasion arises, familiarize himself with the keyboard and the various adjustments of the typewriting machine. This can be done in one of the following ways:

First. By instruction and actual practice at the machine.

Second. By reading the book of instructions which comes with any of the standard makes of typewriter in use in the Navy.

Of the two systems used in learning to typewrite, namely, the touch and the sight systems, the former is held in much greater esteem and is the one taught by all up-to-date business colleges and schools.

By practice it leads to great speed and is not nearly as tiresome to the operator as the old sight method, used by so many of the self-taught members of the hospital corps. By all means adopt the touch method. This method can be easily mastered by following instructions as given in the pamphlets published by manufacturers of typewriting machines which often accompany the new machines. The manufacturers doubtless will gladly send additional copies upon request.

After the beginner has become thoroughly familiar with the keyboard he should avail himself of every opportunity to copy letters pertaining to his department as well as to fill in regulation forms and stated returns. In this way he familiarizes himself with the clerical duties of the medical department and gains valuable practice in the use of the typewriter as well. It should be his constant endeavor to do this work neatly and accurately. In this as in all

other worth-while work "Practice makes perfect." To be able to manipulate the typewriter and to do neat, accurate work, is not only an essential part of the requirements necessary for every member of the hospital corps who seeks promotion to the higher ratings, but also gains for him the esteem of the medical officers with whom he serves.

J. F. M.

HELPING OUT FORM B.

In these days when everyone is Hooverizing and in view of the fact that we have heatless days, wheatless days, and shopless days, it occurred to me that while we were at it, we might as well have a form B day.

Now is the time for every member of the Hospital Corps to give serious consideration to conservation of all articles on form B, and it is thought that if the few following points are observed the results obtained will be most gratifying.

Beyond all question, rubber goods that are obtainable on form B do not last very long, but if a little intelligent care be given these articles they will live beyond the expected period of their usefulness. For instance, it has been my experience that ice caps that had to be surveyed as of no value would, in a great many instances, be still in use had they been handled properly. It seems that most of these articles go to pieces around the cap, and it is due to the fact that when the cap is unscrewed there is entirely too much pressure exerted. This can be eliminated by placing the left hand on the under surface of the cap and at the same time gently unscrewing and not pulling the cap with the right hand. Hot-water bags last a good deal longer if after being used they are hung up to drain and then inflated with air. By doing this the rubber surface will not stick together and deteriorate so rapidly. It was noticed in a recent article of the SUPPLEMENT that rubber goods could be sterilized by boiling. That is quite all right, as far as it goes, but if you have a graduate that has a hard-rubber base, do not boil it with the base attached, unless you desire to obtain a fairly decent "golf ball."

Also, in the same article it was pointed out that the use of a 2 per cent solution of sodium carbonate when boiling instruments would prevent oxidation. Do you use a 2 per cent solution, or approximately a 2 per cent solution, or do you nonchalantly just throw sodium carbonate into the sterilizer? To estimate the capacity of the average instrument sterilizer and the quantity of sodium carbonate required to make a 2 per cent solution takes little time and one need not be a Solomon.

Gum sheets and pillow cases that are thoroughly dried after being used will last so long that it will surprise you. Surgical gauze and muslin bandages are needed in tremendous quantities. You can help out in this respect by using over all muslin bandages that are not too badly soiled, and by using just enough gauze for dressing. It is not necessary to secure a six-layer pack of gauze on an insignificant boil. Safety pins and common pins can be used over and over. Conserve them. Don't give them a passage into the trash bucket. After using a hypodermic syringe resterilize it, wipe it thoroughly dry, and put a drop of liquid petrolatum on the plunger; and don't forget to put on the cap and insert the wires in the hypodermic needle. Very often it is necessary to use a drop or two of liquid petrolatum while passing sounds or catheterizing. If you pour some liquid petrolatum in a medicine glass and then insert the tip of the sound or catheter, you have wasted nearly 8 mills of perfectly good oil, while a drop was all that was required.

Wooden applicators that are served out are 12 inches long. Do you use the entire applicator for one application of tincture of iodine or in swabbing the throat? If you do, you are wasteful. The reply to this may be "Oh, well, wood is cheap." To be sure it is, but it will be cheaper if you do your part.

If a clinical thermometer is held firmly between the thumb and forefinger while being shaken down, the chances of its being broken are reduced to a minimum. You may contend, and I readily grant you, that glassware of all description is easily broken; but if you really are careful, glass articles will last surprisingly long. How many times have you told the man in the dispensary when asked for your stock bottle "It's busted, Chief." Not "I busted it," but "It's busted." More waste, and for no reason. Incidentally I might add that the chief pharmacist's mate in the dispensary gets a true insight into your abilities by daily observation of the stock bottles used in the wards.

There is a scarcity of paper. Labels are paper and will last longer if the contents of the bottle is poured from the opposite side of the label. It is more than likely that a man who is not careful with his stock bottles will not be careful in his management of all affairs pertaining to the sick bay. Such a man, in all probability, will neglect all the small details that a sick person needs and rightly expects from a wide-awake hospital corpsman. One could continue along these lines until nearly every article on form B was embraced, but neither space nor inclination permit.

Various things that are not mentioned in the above will suggest themselves from time to time, and the hospital corpsman who is desirous of attaining the respect of his shipmates and the confidence

of his superiors will get on the job and make all articles on form B last as long as possible and—then some.

R. J. C.

“STOMACH ACHE,” ABDOMINAL PAIN, APPENDICITIS.

To give a cathartic is a common thing.

To give a cathartic to a patient is not ordinarily dangerous and very frequently beneficial.

To give a cathartic to a case of appendicitis may, and often does, produce death.

How can a hospital corpsman be sure that he is not giving a cathartic to one who has appendicitis?

Every bellyache, pain in the stomach, abdominal pain should be looked upon with suspicion and cared for as follows:

Bring the case at once to the notice of the doctor and refuse to give a cathartic to a man who complains of pain in the abdomen or who has had a bellyache, especially if he has vomited. If a doctor is not at hand do not give a cathartic, but give an enema, and put the patient to bed with an ice bag on his abdomen, and place a hospital corpsman on strict guard over him with orders to see that the patient has nothing by mouth, neither water nor food nor milk nor lemonade, nor liquid, nor solid. Then get the doctor.

Your duty when the doctor can not be reached: Keep patient in bed quiet on his back with ice bag on abdomen and give one or two enemas of soapsuds. Tell your commanding officer you have a case of suspected appendicitis and that you want a doctor. If entire day goes by and patient becomes very thirsty give him slowly and gently by rectum about 8–10 ounces of warm salt solution (a teaspoonful of salt to the liter) three to four times during 24 hours.

Prior to arrival of the doctor take patient's temperature and pulse every three hours and record it.

The symptoms of appendicitis are: Nausea and vomiting; pain in abdomen, severe or slight; tenderness in abdomen on pressure over right illiac fossa; rigidity of muscles of abdomen, especially right side, slight or marked; pulse rising, 80 to 90 and up. A pulse of 110 in appendicitis means danger for the patient. A pulse of 120 almost always means peritonitis.

Don't try to make a diagnosis of appendicitis, but suspect that every case of abdominal pain with or without vomiting may be a case of appendicitis, and remember to give patient nothing by mouth, neither liquid nor food nor cathartic, and call the doctor.

(Ed.)

MEDICAL DEPARTMENT REQUISITIONS.

Failure on the part of those concerned to thoroughly familiarize themselves with instructions governing the preparation of requisitions for medical and dental supplies, as laid down in the "Manual for the Medical Department, 1917," "U. S. Navy Regulations and Instructions," and the "Handy Book for the Hospital Corps, U. S. Navy" (pp. 317 to 325, inclusive), is a continual source of embarrassment to the Bureau of Medicine and Surgery, inasmuch as valuable time is taken up in correcting errors and with correspondence relating thereto.

Among the numerous errors of commission and omission occurring in requisitions submitted to the bureau for approval may be cited the following:

Duplication of serial numbers during the fiscal year.—The medical department of a ship or station should commence numbering all of its requisitions serially on July 1 and continue the numerical series until the end of the fiscal year (June 30), and no distinction should be made between requisitions prepared on medicine and surgery forms and those prepared on supplies and accounts forms. In order to avoid the duplication of requisition numbers from vessels the writer suggests that a book be kept showing the number of the requisition, form used (M. & S. 1, 4, B. B-a, S. & A. 44, etc.), date forwarded for approval, date of receipt of stores, and, in the case of supplies received from a supply depot, date of forwarding receipted "first" to the supply depot concerned and the "second" to the Bureau of Medicine and Surgery. In this connection attention is invited to the fact that when a requisition is disapproved or canceled in the bureau the ship or station copy of the requisition (third) should be so marked and placed in the files, and the serial number borne by the canceled requisition not assigned to a subsequent requisition during that fiscal year. In order that the files of the vessel or station may be complete all correspondence relating to a canceled requisition should be filed with it. In re the above see paragraph 3375, Manual for the Medical Department, 1917; also paragraph 2, page 2, form B.

Form 4 requisitions for articles not regularly issued or listed on the Supply Table of the Medical Department or on Form B Dental, Revision of 1916. Because of the enormous demands now being made upon the supply depots form 4 requisitions are being limited to such supplies as are regularly issued or listed on the Supply Table or Form B Dental, 1916 Revision. Every article not carried in stock at the supply depot necessitates special purchase, which greatly increases the work, not only of the supply depot, but of the Bureau of Medicine and Surgery and the Bureau of Supplies and Accounts. When form 4 requisitions for dental supplies are to be prepared,

Form B Dental, Revision of 1916, should be consulted, as, due to this revision, the list of dental supplies contained in the Supply Table of the Medical Department of the Navy, 1915, is now obsolete and should be disregarded. In this connection it may be stated that both the medical and dental supply tables are now being revised and many additions are being made. These new supply tables will be available for issue about May 1, 1918.

Failure to enter requisition number, date, and the name of ship or station, where indicated on requisition form.

Placing regular Form B, Form B Dental, and additional articles on the same requisition (form 4). As separate and distinct books are kept at the supply depot for each of the above mentioned classes, the additional amount of clerical work involved by a requisition covering more than one class is obvious. See article 3933 (a), Manual for the Medical Department, 1917.

Failure to state the units of articles required for on Form 4, such as "number," "bottles," "dozen," "box," "pair," etc.

Alteration of Form B and Form B-Dental by erasure, addition, or interlineation. See paragraph 3931 (1) (h), and paragraph 3931 (2) (c), Manual for the Medical Department, 1917, also paragraph III, page 2, form B.

Requisitions for articles listed on the Supply Table submitted on S. & A. Form No. 44, with the request that they be issued by the supply depot. Such requests should be submitted on M. & S. forms B or 4.

Failure to number items on Form 4 and Open Purchase requisitions. Item numbers should be continuous throughout a requisition and not numbered separately by classes.

Failure to insert number of different sizes of ligatures, bandages, bottles, capsules, gloves, etc., as required.

Requests on Form B-Dental for burs, reamers, drills, carborundum points, etc., in amounts other than the number contained in a package, or multiples thereof. See paragraph 3931 (2) (d), Manual for the Medical Department, 1917, also footnotes on pages 4, 5, and 7, form B-Dental, Revision of 1916.

Failure to number quadruplicate copies of requisition Forms 4, B, Ba, and B-Dental, e. g., "Quadruplicate First," "Quadruplicate Second," etc. See paragraphs 3931 (1) (c), 3931 (b), and 3933 (b), Manual for the Medical Department, 1917.

Incomplete specifications or descriptions covering items required for on Open Purchase requisitions. See article 4654 (2) (d), Naval Instructions.

Failure to state the voltage and character of current upon which electrical apparatus required for is to operate.

Open Purchase requisitions involving more than one appropriation. See article 4654 (2) (b), Naval Instructions.

Open Purchase requisitions for proprietary articles not coming within the provisions of article 4654, paragraph 2 (f), Naval Instructions.

Underestimation of cost of items on open-purchase requisitions, later necessitating a request for increase in estimate and thereby causing a delay in the delivery of articles required.

Failure to enter estimated cost of items on memorandum copies of open-purchase requisitions. See article 4654 (2) (g), Naval Instructions.

Entering estimated cost of items on the "First" of open-purchase requisitions.

Failure to state the object for which supplies required for on open-purchase requisitions are needed or the authority for the submission of the requisitions. See article 4654 (2) (h), Naval Instructions.

Requisitions for typewriters for use of the Medical Department of vessels. See article 4571 (4), Naval Instructions.

Failure to state the number of typewriters or computing machines on hand when submitting a requisition for the same for use ashore. See article 4571, Naval Instructions.

Requisitions for supplies far in excess of allowance not accompanied by an explanatory letter.

Failure to classify articles required for on Form 4 according to the Supply Table. See paragraph 3933 (g), Manual for the Medical Department, 1917.

Requisitions for finger-print outfits. See "Note" bottom of page 137, Manual for the Medical Department, 1917.

Requisition for Stokes's splint stretchers, mattresses, pillows, etc., from vessels. See paragraph 3421, Manual for the Medical Department, 1917.

Requisitions for identification-tag outfits. These outfits are furnished by the Bureau of Navigation. See General Order 294, dated May 12, 1917.

Requisitions for platform scales for use at recruiting stations. Platform scales are furnished by the Bureau of Navigation and not by the Bureau of Medicine and Surgery.

Before submitting a requisition to the Bureau for approval a careful study should be made of the regulations governing the type of requisition concerned, for strict compliance with the regulations will greatly facilitate the delivery of supplies and reduce to a minimum the correspondence relating thereto.

When an open-purchase requisition from a hospital or shore station is to be submitted the local supply office should be consulted to ascertain whether or not the articles to be required for may be obtained

through the supply officer on existing supplies and accounts contracts. The standard stock catalogue issued by the Navy Department in loose-leaf form is designed to cover all supplies regularly carried in stock by the supply officer at various designated navy yards. The catalogue furnishes data relative to the cost per unit, weights, specifications, nomenclature, stock numbers, distributing yard, etc., and may be consulted at the office of the local supply officer. Standard specifications are laid down for the guidance of those concerned in requisitioning certain naval supplies. An "Index of specifications for naval material" is published at intervals by the Bureau of Supplies and Accounts, referring by name, number, and date to the specifications as separately printed. Copies of standard specifications will be found on file at the office of the local supply officer. Specifications under annual and quarterly contracts are distributed by the Bureau of Supplies and Accounts prior to the first of each fiscal year as supplements to the bureau memorandum, covering provisions, coal, gasoline and distillate, lubricating oil, fuel oil, boiler gaskets, CO₂ gas, and tool steel. "Requisitions for material for which standard specifications have been adopted shall adhere strictly to such specifications. Should it be found necessary to modify standard specifications, reasons for such modifications shall be stated, and, except in urgent cases, the requisition and reasons for modification shall be submitted to the bureau concerned." (N. I. 4659.)

The following form should be used on requisitions in referring to "Standard specifications": "*(Name of article)* to be in strict accordance with Specifications *(number)* issued by the Navy Department *(date)*." The latest issue of specifications must be referred to, as published in the current index. Among the numerous articles used by the medical department at hospitals and shore stations that are covered by standard S. and A. specifications may be noted the following: Fire hose, hospital mattresses, mattress covers, pillows, pillow covers, portable fire extinguishers, linoleum, hospital tents, potato peelers, dish-washing machinery, laundry machinery, dough-mixing machinery, etc. When a requisition for furniture is to be submitted from a naval hospital or shore station the contract schedule of the Bureau of Yards and Docks should be consulted at the Office of the local public works office. See page 324, Handy Book for the Hospital Corps, U. S. Navy, 1917.

When articles are missing from a shipment of medical stores the matter should be taken up directly with the supply depot concerned and not through the Bureau. However, before such a report is made, a thorough search should be made through all packing, small packages, cartons, etc., included in the shipment, as often, in order to utilize every available inch of stowage space, the supply depot

packers will place small articles in boxes, cartons, etc., containing hot-water bags, irrigators, tablet triturates, and similar items.

While requisitions for typewriters to be used by the medical department and shore stations must be submitted to the Bureau of Medicine and Surgery on requisition form 1, those for use of the medical department afloat are furnished direct by the Bureau of Supplies and Accounts through the supply officer of the vessel concerned. Requisitions for typewriters and computing machines for use at shore stations must show the number in use and bear no other item. They should never be purchased in advance of the bureau's formal approval. (Art. 4571, Naval Instructions.)

Sterilizers and incubators for vessels, if allowed, are furnished and installed by the Bureau of Construction and Repair.

Modification or elimination in the Bureau of certain items on a requisition may be due to any one of the following reasons:

Unusual market conditions resulting in a shortage of the articles requested.

Requests for supplies far in excess of allowance when the necessity therefor is not apparent to the Bureau. A requisition of this character should always be accompanied by an explanatory letter.

Requests for articles not regularly supplied the type of vessel, base, or station, from which the requisition emanates. Such a request should be accompanied by a letter explaining the necessity therefor.

In order to reduce the amount of work at the supply depots, which at this time is an important factor, the number of bottles, tins, jars, rolls, etc., requested for may be reduced or increased to conform to the number of such articles contained in original boxes or packages.

E. L. S.

WITH A CAMERA IN SAMOA.

Members of the Hospital Corps of the United States Navy are stationed in many of the out-of-the-way corners of the world. We present here a few views taken by Pharmacist L. C. Sims, United States Navy, while on duty in Samoa. Important features of the naval station at Tutuila, Samoa, are the naval dispensary and the native hospital. The latter is managed by a naval medical officer assisted by members of the Hospital Corps and Navy nurses. An up-to-date drug store or pharmacy is maintained in connection with the native hospital, and the revenues from this source help to maintain the hospital. The store is managed by members of the Hospital Corps under the supervision of the medical officer. During the year 1917 more than 12,000 cases were treated in the native hospital and the two branch dispensaries connected with it. Three hundred and eighty-five operations were performed and more than 17,000 dressings applied. The pictures on the opposite page show a native village in one of the islands of the Manua Group. Here, 70 miles from the naval station and thrown entirely upon his own resources, is stationed a chief pharmacist's mate to minister to the sick and injured natives. The Manua Group has a population of about 2,000.

Hospital and dispensary are also seen. The hospital is the building of native type in the foreground. It contains no beds, as the natives prefer to sleep on mats spread on the coral floor.

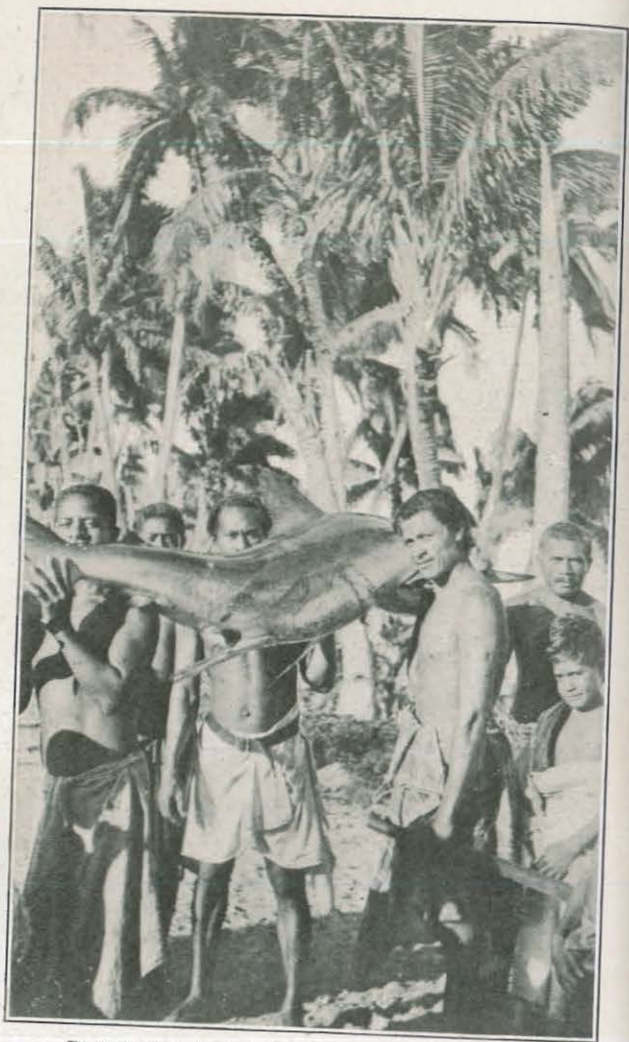
The most remarkable of all the pictures is that showing the operation of tattooing being performed upon an adult male Samoan. All male Samoans are tattooed with some complicated pattern extending from the waist to the knees. The pigment is tapped into the skin by means of shark's teeth and a little hoelike instrument of metal. Though asepsis is utterly unknown, infection, strange to say, is rare.

The young ladies seated at the extremities of the victim are present at the operation in the capacity of witnesses of his conduct during the rather painful ordeal. Should the subject of the operation squirm and fidget more than seems to the girls compatible with a brave and heroic character, they will spread the news of his weakness broadcast in the community.

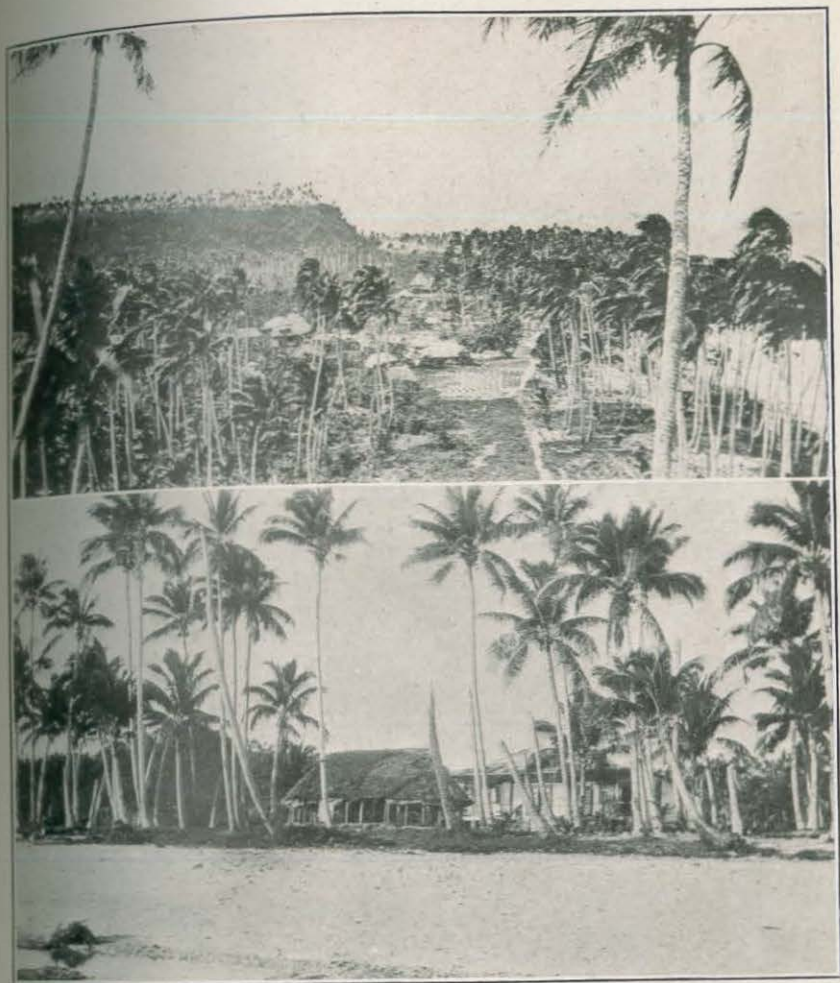
Note the individual at the extreme end of the picture smoking an American pipe. The expression of his face seems to say, "It hurts a little, yes, but what of it?" The maiden who is holding down the



Tattooing. The women are present to observe and report on the patient's fortitude during the operation.



Preparing for a feast. The shark is considered a delicacy.



Native village. Hospital and dispensary.



Samoan children. Natives playing cricket.

victim's head with one hand and yet supporting it with her leg wears a troubled expression. Doubtless it is due to the intrusion of the photographer and not to the conspicuous place which her large right foot is destined to occupy in the foreground. The professional tattooer is preoccupied with his task and has no thought either for the nerves of his patient or the presence of an outsider. The girl steadying the patient's feet is a good counterpart for the gentleman with the pipe. Her brows are contracted, but only because the sun is shining full in her eyes, and she deserves no little credit for her composure in spite of the pain that the other fellow is feeling. As for the central figure in this remarkable group, he has our sympathy. His features suggest unqualified disgust with his situation. He is shading his eyes from the sun, and it is fortunate for him that the observers who are to report upon his fortitude can not see his face, as it portrays something more than consciousness of the sun's rays.

NEWS ITEMS.

Enrollments in the Naval Reserve Force, Hospital Corps, are very few at this time, as district needs are now largely met. In a few naval districts a short course of training has been given to hospital corpsmen of the Naval Reserve Force. Classes of about 50 from these districts are now being sent to naval vessels to continue their training at sea. It is believed that with the exception of the dental and medical students all hospital corpsmen of the Reserve Force are now on active duty, about one-third of them being on duty within the district, one-third at sea and the other third with naval hospitals in the war zone or slated for such active duty. While the hospital corpsmen of the Reserve Force in many cases failed to receive the benefit of attending a regular Hospital Corps School, reports show that once at sea these men give a good account of themselves in spite of the initial handicap.

Enrollment of dental and medical students was authorized on November 28. These students are enrolled as hospital apprentices, first class, and are allowed to remain at their dental or medical studies in accordance with a provision similar to that made for the Enlisted Medical Reserve of the Army. The recent selective-service law would have practically emptied the dental and medical schools if these provisions had not been authorized by Congress and the Secretaries of the Navy and of War. Over 1,000 dental and medical students are now enrolled in the Hospital Corps in this manner.

Enlistments in the regular Hospital Corps still must be kept down to the allowed quota of 125 a month, though many more could be enlisted at this time if the Corps were not so near its full strength.

Larger vessels of the Navy now have hospital corpsmen in excess of allowed complement in order that as many as possible may gain the sea-going experience so essential to qualify for the upper ratings. Certain ships have been ordered to transfer once a quarter one hospital corpsman holding one of the upper ratings to a receiving ship for general detail. From the receiving ship these men are transferred to ships fitting out. After leaving the receiving ship many of these will find themselves on independent duty where their knowledge and experience will be tested. This flow of hospital corpsmen from ship to ship will give the best men the most experience and keep them alert and interested in their work by a variety of duty.

New hospital ships carry about 80 hospital corpsmen each. These ships have now plenty of work and will undoubtedly, in the near future, be called upon to carry a heavy burden of work and responsibility.

Hospital corpsmen in port from vessels of the cruiser force find certain hospitals and clinics in the city of New York open to them, so that during a stay in port the ambitious and energetic hospital corpsmen may be sent from these ships into these civil hospitals ashore to gain a new view of the hospital corpsman's work and duty and to carry back to the ship the enthusiasm that comes from an exchange of views with others engaged in a similar undertaking.

Pharmacist's mates (first class) or chief pharmacist's mates assigned to a vessel to which no medical officer is attached have interesting, important, and difficult duties to perform. They must keep their eyes open, their minds receptive; they must study and observe and learn from books and from practical experience on board ship and elsewhere in order to be capable of solving the problems which will come to them on such duty.

Intensive training along special lines in laboratory work, duty with Marine Corps, with aviation units, has been given a few hospital corpsmen, but such special training will not be kept up indefinitely, nor will the men so trained be necessarily kept during their entire enlistment at such special work. The efficient hospital corpsman of the Navy is an all-round man, able to help the doctor or dentist in any and every emergency or in the "daily grind," and he must be able to act independently and for the best interest of the patient as a first-aid man in the absence of a medical officer.

The Minneapolis School of Medicine, which is now giving a second course of nursing, etc., to a second-class of 100 hospital corpsmen, is doing excellent work, and the men trained at that school are giving a good account of themselves in the service.

Reports from Marine Forces show that the newly enlisted hospital corpsmen who have been assigned to duty with that branch of the Navy have taken hold of their work with a vim and are making good.

Hospital Corps schools still have a large number of men in training—about 500 in each—but unless a further increase of the Navy is authorized the number in the Hospital Corps schools will diminish next summer. The new school at Norfolk naval operating base still is in its early stages. The building which is to be its permanent home has not as yet been put up, but temporary quarters have been assigned where it is hoped much may be accomplished.

A survey of the Hospital Corps shows some interesting facts and figures. In regard to the educational advantages which the hospital

corpsmen have had prior to enlistment, 75 per cent of the hospital corpsmen are high-school students or graduates, and 9 per cent are college men. Probably a very large number were premedical students, and when the present emergency is over a considerable number of these men will probably return to college to take up an academic or professional course. Such practical and theoretical knowledge as these men may gain in the Hospital Corps will make them more self-reliant and better qualified for a return to college, a continuance in the Navy, or entrance to some vocation in civil life.

Over 600 college men, 6,000 high-school men, and 1,000 grammar-school graduates compose the Hospital Corps of to-day. Among these are about 70 medical students, 45 premedical students, 12 dental graduates, and 45 dental students. There are comparatively few pharmacists, either student, graduate, or registered. The great majority of corpsmen are ambitious, enthusiastic youngsters with a grammar or high school education. That is the right kind of material for the Hospital Corps. These young men without any special qualifications or ability, young men who prior to enlistment had been out of school but a short time or who had not become especially qualified for a vocation or profession in civil life, find in the Hospital Corps of the Navy many opportunities. If they grasp the opportunity of promotion as it is presented to hospital corpsmen to-day they will secure a permanent vocation which will equal if not excel a great many in civil life. Or they may acquire knowledge or training in the Hospital Corps which will prepare them for various civil-life positions, such as, for example, pharmacist, chemist, laboratory assistant, anaesthetist, industrial first aid, etc.

A *questionnaire* recently sent to the naval districts produced interesting results regarding the special qualifications of a few hospital corps men. Over 100 men were classified, as follows:

Graduate or undergraduate of technical school in the course of sanitary engineering	22
Actual experience in municipal or State boards of health or similar organizations	20
Practical experience in connection with fieldwork under municipal or State boards of health or similar organizations	15
Practical experience in connection with water supply and sewage disposal	26
Practical experience in manufacturing plants in connection with industrial hygiene work and safety engineering	18

Many hospital corpsmen not classified above have had training and experience which will be of value to them in the performance of their Hospital Corps duties. Among the members of the Hospital Corps are men who have been masseurs, osteopaths, opticians, physical instructors, X-ray technicians, swimming instructors, chemists, laboratory assistants, anaesthetists, chauffeurs, teachers, etc.

Expiration of enlistments.—During the past six months about 75 men left the Hospital Corps by reason of expiration of enlistment. During the same period about 125 reenlisted. With many ambitious young fellows right behind, all "short timers" should realize that they can not afford to "lay off" upon the expiration of their enlistments and should decide to ship over without delay.

Change of rate.—During the past six months about 150 men changed their rate from the seaman and other branches to the Hospital Corps. During the same period about 300 hospital corpsmen changed their rate to seamen, radio, fireman, etc. The great majority of these men enlisted or enrolled last spring and have left because they found themselves unfitted for the Hospital Corps and therefore dissatisfied.

Discharged.—In addition to these men who left the corps in order to transfer to another branch of the service about 25 men were given medical surveys, 10 were discharged because of bad conduct, and 10 discharged as undesirable.

Commissioned.—On December 20, S. R. Jandorf, hospital apprentice, first class, U. S. N. R. F., received his commission as ensign, U. S. N. R. F., together with orders to report to the commandant of the fourth naval district for duty. Jandorf entered the service last July and since that time has been stationed at the Naval Medical School, Washington, D. C.

Thomas E. Renaker, formerly hospital apprentice, first class, U. S. N. R. F., successfully passed the examination held last month at the navy yard, Washington, D. C., for provisional appointment as assistant paymaster, U. S. N. R. F., and was commissioned on February 7, 1918. He was ordered to the naval pay officer school, at the Catholic University, Brookland, D. C., where he is now undergoing the intensive training given to officers of the Pay Corps.

R. L. Tegart, pharmacist's mate, second class, U. S. N. R. F., received an appointment as assistant paymaster, U. S. N. R. F., on February 13, 1918. Tegart had been on duty at the dispensary, navy yard, Puget Sound, Wash.

William P. Peterson, pharmacist's mate, third class, U. S. N., attached to the dispensary of the Washington Navy Yard, has received an appointment to the Naval Academy, Annapolis, from Congressman Burton E. Sweet, of Iowa.

Examination for advancement.—For the information of the Hospital Corps, the following quotations from the Bureau of Navigation's Annual Circular, 1918, are made:

Paragraph 36. "Before advancement to any higher rating, a hospital corpsman must have served satisfactorily in all respects in his present rating, must have received during this period an average mark of not less than three (3) in proficiency in rating and obedi-

ence and four (4) in sobriety, and have a record clear of infractions of discipline for the past year. He must pass the required examination, attaining the required mark for the rating. No man shall be advanced to any rating unless recommended favorably by the medical and commanding officers."

Paragraph 44. "The examination for these ratings (chief pharmacist's mate, permanent and acting, and pharmacist's mate, first class) shall be conducted in accordance with the above outline before a board of three medical officers, or two medical officers and a pharmacist, at least one of whom has had two years' service in the Navy, detailed from station or ship other than that upon which the candidate is serving, if practicable."

Paragraph 45. "When a board of medical officers has favorably recommended the advancement in rating to hospital apprentice, second class; hospital apprentice, first class; pharmacist's mate, third class; or pharmacist's mate, second class, the commanding officer shall forward the report on form N. M. S. H. C. (examination report of Hospital Corps), marked in all subjects required for the rating. When a board of medical officers has favorably recommended the advancement of a hospital corpsman to the rate of pharmacist's mate, first class, or chief pharmacist's mate (acting or permanent), the commanding officer shall forward to the Bureau of Medicine and Surgery, in addition to the form N. M. S. H. C. marked in all subjects, the following papers: Evidence of the work the candidate was required to do in his practical examination (a list of the procedures undertaken, with the results obtained), a specimen of and a statement as to the proficiency in typewriting, the candidate's written questions and answers, and form N. M. S. 42022 (statement of man's special qualifications). For the rate of pharmacist's mate, first class, a mark of at least 3; for rate of chief pharmacist's mate, acting, a mark of at least 3.2; for chief pharmacist's mate, permanent, a mark of at least 3.5 is required."

When papers are forwarded to the Bureau of Medicine and Surgery in accordance with the above directions, the Bureau is kept fully informed of the qualifications of individual hospital corps men. Any questions which a hospital corps man desires answered about his own advancement must always be made to the Bureau through official channels.

Changes in Hospital Corps Forms.—The following changes in Hospital Corps forms have been made. Some of the changed forms are now in use and the entire new set will be in general use in the near future.

Minor changes were made in the examination report, formerly N. M. S. H. C., now N. M. S. H. C. (I). As before, the form is to be

forwarded in duplicate, one copy to commanding officer, one to Bureau of Medicine and Surgery when a recruit is recommended for first enlistment or enrollment in the Hospital Corps, and when a man is recommended for change of rating to the Hospital Corps, and when a hospital corpsman is recommended for advancement in rating.

The only change made in the efficiency report N. M. S. H. C. was to add the numeral (2). This report N. M. S. H. C. (2) is to be forwarded, as usual, to the Bureau of Medicine and Surgery whenever a hospital corpsman is transferred.

A radical change was made in the Hospital Corps post card 125682. The name has been changed to "Disposition card," N. M. S. H. C. (3). The new card is a double, perforated form, with instructions on the back of the bottom card, as follows:

HOSPITAL CORPS TRANSFER AND DISPOSITION CARD.

Fill out both cards upon arrival of hospital corpsman at ship or station. *Red print* card to be forwarded immediately to the Bureau of Medicine and Surgery. *Black print* card to be kept in file until hospital corpsman is transferred or otherwise disposed of, when it is to be completed and forwarded to Bureau of Medicine and Surgery.

Also to be filled out and forwarded to Bureau of Medicine and Surgery upon first enlistment or enrollment, reenlistment or reenrollment upon change of rate to or from the Hospital Corps, and upon discharge or cessation of active duty.

The purpose of this report is to keep the Bureau of Medicine and Surgery informed of all movements of hospital corpsmen, including pharmacists.

The Weekly Memorandum of the Hospital Corps has been changed to Roster Report N. M. S. H. C. (4). Space has been made for reporting the authorized complement and the actual number on board. Instructions are given at the top of this form as follows:

To be forwarded from naval hospitals and receiving ships within the continental limit of the United States weekly. From other naval hospitals, offices of medical aids to commandants, hospital ships, Hospital Corps schools, and training stations *monthly*. From force surgeons when practicable.

The statement of special qualifications for chief pharmacist's mates and pharmacist's mates, first class, has been changed only by giving it the reference designation N. M. S. H. C. (5) instead of N. M. S. 42022. This form is to be forwarded by the medical officer with whom the hospital corpsman is serving to the board which examines him for advancement to the rating pharmacist's mate, first class, or chief pharmacist's mate, acting or permanent appointment.

The Bureau of Medicine and Surgery desires that when a board of medical officers recommends a hospital corpsman to the commanding officer for advancement in rating to the rate pharmacist's mate, first class, or chief pharmacist's mate, acting appointment, the following papers be forwarded direct to the Bureau of Medicine and

Surgery for its files and for review: N. M. S. H. C. (1), marked in all subjects (old designation N. M. S. H. C.). N. M. S. H. C. (5), statement of special qualifications (old designation N. M. S. 42022). In addition to the other evidence as required by paragraph 45, page 11, Bureau Navigation, Annual Circular, 1918.

Form N. M. S. O. request for blank forms has been rearranged and changed in accordance with the new Hospital Corps forms. The following are the new and old arrangements:

New Form O.	New designation.	Old designation.
Hospital Corps:		
1. Examination report.....	N. M. S. H. C. (1)	N. M. S. H. C.
2. Efficiency report.....	N. M. S. H. C. (2)	N. M. S.
3. Disposition card.....	N. M. S. H. C. (3)	Post card 125082.
4. Roster report.....	N. M. S. H. C. (4)	N. M. S. sp.
5. Special qualifications.....	N. M. S. H. C. (5)	N. M. S. 42022.

CLIPPINGS.

LIQUID FIRE.

The Germans have not hesitated to introduce any of the ancient or modern weapons of offense and defense which they thought would be of advantage, regardless of Hague conventions or accepted standards of civilization. Among these is "liquid fire," a weapon of value principally because of its demoralizing effect upon those attacked. There have been casualties resulting from liquid fire, but it is the psychological effect that is sought.

The apparatus usually consists of a metal tank holding about four gallons of liquid to be burned, a section of pipe from this tank to a rubber hose at the other end, in which there is a smaller metal pipe about a yard long fitted with a nozzle and a friction igniter, as well as an oil-burning wick. There is a valve near the tank and another near the nozzle. Benzol, from coal tar, and crude oil are used in equal proportions and are carried in the tank under a pressure of approximately 300 pounds per square inch, this pressure being maintained by compressed nitrogen, an inert gas having no effect upon the contents of the tank. The tank and accessories are carried by one man, while the nozzle is carried by a companion when liquid is being burned. Or it may be fixed in position and operated by the same man who carries the tank.

In use a cap is drawn from the end of the nozzle and a wick burning kerosene or similar oil is thereby lighted, since the cap is a friction igniter. The oil is then turned on and is ignited as it leaves the nozzle under great pressure. The result is a flame of burning oil about 30 yards long. For two-thirds of this distance the flame is straight, but it then turns up as does any other flame. The flame may be directed against the ground, but care must be taken not to deflect it too sharply, as it may strike the ground and turn back toward those operating the device. It is, therefore, not well suited to turning down into a trench.

It is claimed by an expert from the American Chemical Society that liquid fire is not so effective a weapon now that it is understood by the troops and means for defense have been worked out. It can be readily understood, however, that a number of such devices, with the roar of the escaping oil, when used together, gave a means of demoralizing the defenders of a trench, especially at night, and in the beginning was a valuable accessory, especially by raiding parties.—*H. E. Howe, in the Practical Druggist, October, 1917.*

DICHLORAMINE-T, A SYNTHETIC GERMICIDE FOR USE IN WOUNDS.

Experience of surgeons with English and French wounded, and particularly the work of the American Ambulance in Paris, tends to show that with the exception of the chlorin preparations, all other antiseptic agents strong enough to be effective, really hindered rather than helped in the control of suppuration and the process of repair.

The drawback to irrigating wounds by the hydraulic system by means of modifications of Labarraque's solution were that such solutions had to be made with great care and freshly prepared almost daily; also that these chlorin solutions have a highly irritating effect upon the skin if they remain in contact with it for any length of time, calling for special protection of the skin or else unfortunate reaction in the way of burning, itching, and painful surfaces resulted.

The method developed of protecting such skin surfaces has been to apply vaseline on sterile gauze. Weakening the chlorin solutions to the point that they were nonirritating made them of doubtful value, and to confine the chlorin solution to the wound cavity meant that such solution had to be constantly renewed on account of the rapidity with which it united with the protein and other exudates of the wound, changing its nature entirely. Hence the necessity of constant immersion in the solution and the regular renewal, making the dressing by this means complicated and time devouring.

The investigations of the group of physicians mentioned indicated that a different principle may be applied to good purpose—namely, the use of a liquid dressing which unites with the protein and wound exudate material in such a manner as by chemical action to become active rather than inactive. It was argued that if such a remedial agent could be found, the dressing would continue to be effective over a period of several hours, would be less troublesome, and would hasten the process of healing by the constant destruction of harmful bacteria.

Such a preparation was finally located and experiment has found it to be satisfactory to an astonishing degree. The chemical used is sodium salt of toluene-parasulphochloramin. This is now being marketed under the trade name of chlorazene. The report of the eminent surgeons declares that: "This synthetic chloramin is non-irritating to the skin and wound surfaces, and can be used in aqueous solutions in a concentration of 2 per cent, which has approximately four times the germicidal value of the currently employed solutions of hypochlorites."

This was a distinct step in advance in two particulars—first, in that the skin and wound were not irritated; and, second, in that the chemical reaction and the process of disinfection were one and the

same. However, the drawback still was that, being an aqueous solution, it disappeared in the course of about two hours and had to be renewed.

To overcome this rapidity of disappearance and absorption, it was finally decided to dissolve an excess of the chloramin in an oily medium which would render it more stable and allow it to part with its remedial property more slowly as it diffused into the surrounding wound.

For this purpose a dichloramin was used (toluene-parasulphon dichloramin), which is better known by the name of dichloramin-T. Its users declare that: "As a solvent we have used eucalyptol chlorinated as described below with or without liquid paraffin, similarly chlorinated, to limit their decomposing action on the dichloramin-T."

It has been found that a 10 per cent solution of dichloramin-T in eucalyptol may be kept in a colored bottle for at least 30 days, with but 25 per cent decomposition. This gives a solution from twenty to forty times the mass of germicide ever possible to have present in the usable concentrations of hypochlorites, and permits of a dressing which will liberate its germicides slowly over a period of from 18 to 24 hours, instead of from 30 or 40 minutes to 1 hour.

According to the report of Drs. Dakin, Lee, Sweet, Hendrix, and Leconte the preparation of dichloramin-T was worked out for Chat-taway's method of preparation, which was very fully described in last month's *Era*, page 380. The preparation of "chlorinated eucalyptol" is prepared as follows:

Eucalyptol (U. S. P.), not eucalyptus oil, must be used. Five hundred cc. are treated with 15 gm. of potassium chlorate and 50 cc. of concentrated hydrochloric acid. After 12 hours the oil is well washed with water and sodium carbonate solution. Dry sodium carbonate is added to the oil, and the mixture is allowed to stand 24 hours. It is then filtered and dried with a little calcium chloride.

PREPARATIONS OF CHLORINATED PARAFFIN OIL.

Five hundred cc. of commercial liquid petrolatum are treated with 15 gm. of potassium chlorate and 50 cc. of concentrated hydrochloric acid. The mixture is exposed to the light and allowed to stand overnight. It is then put into a separatory funnel and washed successively with water, sodium chloride solution, and water. The opalescent oil is tapped off, a lump or two of calcium chloride and 5 gm. of charcoal are added, and the oil is filtered with suction.

In order to determine the amount of liquid petrolatum which can be added to the eucalyptol solution of dichloramin-T, the following mixtures were made:

Solution 1. One part liquid petrolatum to 2 parts 15 per cent eucalyptol solution.

Solution 2. One part liquid petrolatum to 1 part 15 per cent eucalyptol solution.

Solution 3. Three parts liquid petrolatum to 5 parts 15 per cent eucalyptol solution.

Solution 4. Two parts liquid petrolatum to 1 part 15 per cent eucalyptol solution.

These solutions were placed in test tubes, stoppered tightly, and preserved in the refrigerator at about 0 C. All solutions became somewhat turbid as soon as the liquid petrolatum had been added, but in 48 hours there was no appreciable settling out in any case. After a week, however, the dichloramin-T had partially crystallized from solutions 3 and 4. Solutions 1 and 2 were no more turbid than just after the addition of the liquid petrolatum, and none of the dichloramin-T had crystallized out.

This experiment seems to justify the conclusion that no more than an equal part of liquid petrolatum should be added to a 15 per cent solution of dichloramin-T in eucalyptol when the solution is to be kept for any length of time, but when the mixture is to be used immediately, as much as two parts of liquid petrolatum to one of the 15 per cent eucalyptol solution may be used.

The report states that in comparing the practical surgical value of dichloramin-T with aqueous hypochlorite solutions in the treatment of infected wounds, which in spite of many serious objections has given such promising results, the laboratory and clinical findings thus far warrant the following statements:

1. Dichloramin-T is a nonirritating synthetic germicide, and corresponds to the antiseptic chloramin substances found in minute quantities when nascent chlorine of the aqueous hypochlorite solutions is brought into contact with the exudate of suppurating wounds.

2. Dichloramin-T can be used in strengths of 20 to 40 times greater than is possible with the hypochlorites and in oily solution, which makes possible the slow elaboration of the germicide over a period of from 18 to 24 hours instead of a rapid disappearance in from 30 minutes to 1 hour as with the hypochlorites.

3. Its use is as simple as the application of the tincture of iodine, and we can see no reason why it can not be used to replace iodine as a primary dressing. In our experience it is just as effective as a germicide and is without the destructive effect on the tissue cells. We have had the opportunity of using it in this way at the primary operation in seven wounds involving soft tissues, tendons, joints, and bones, and have not failed to have primary union. One case, a compound fracture of a metacarpal with severed extension tendons, did not receive treatment until three hours after the injury.

4. The chlorine in dichloramin-T, as in the hypochlorites, has the power of dissolving dead tissue. Hemorrhage, therefore, must be stopped by ligation, else the clot will dissolve and secondary hemorrhage may follow.

5. One should not depend on a chemical agent to perform, in the treatment of suppurating wounds, for that which and should be done quickly and thoroughly by mechanical means. Neither chemistry nor bacteriology can do

should be expected to replace the mechanics of surgery. At the best these chemical germicides can react only on the bacteria with which they actually come in contact, which means a very superficial process. Therefore, at the primary operation, all infected tissue, foci, and devitalized tissues must be removed when possible by surgical procedures. Finally, adequate drainage, dependent if indicated, must be provided.

The details outlined in this report show the direction of the progress of medicine by the modern scientific method. It is certain that if the therapeutic application of many of the synthetic remedies that have made claim for professional recognition had been as carefully studied as dichloramin-T has been, there would have been fewer disappointments to record in the appropriation of remedial measures to the curing of disease. War is accompanied by atrocities, pain, disease, and death, but history teaches that in its wake have followed some measures which have marked certain advancements in the experience of humanity. That the science of medicine will profit by the investigations prompted by the necessities of the great contest now waging is positive and convincing. The surgeon, chemist, and pharmacist will each have their particular problems to solve, and the work that is now being done may be taken as indicating the future line of advance.—*The Pharmaceutical Era, February, 1918.*

EXPLOSIVES.

An explosion takes place when two or more bodies which may be inert in the cold proceed to unite chemically in the presence of heat or under conditions favorable to their union, with such intensity that the whole thing is over almost as soon as it is begun. One other thing is necessary, and that is that the products of the chemical union or those cast aside in the process shall have much greater volume than the unexploded mass. The gases set free by an explosion of gunpowder occupy about 300 times the volume of the powder. The gases that result from an explosion of nitroglycerin take up 1,200 times as much room, and those are expanded by the heat produced nearly 8 times more. It is quite a jolt!

Substantially all commercial high explosives in the United States contain nitroglycerin. Its ways are well known and it serves the purpose required of it. The trouble is that glycerin of which, with nitric and sulphuric acids the explosive is made, has risen in price from 12 cents a pound a few years ago to 60 cents and more at present. John R. Mardick, a member of the American Chemical Society, has written in the current number of *Metallurgical and Chemical Engineering* on the wisdom of making other bodies which cost less take the place of the explosive glycerin. Low-priced explosives are

very much needed in engineering undertakings and in mining. These will be possible as soon as the war is over if made of certain coal-tar bodies with nitric and sulphuric acids. The complaint is made, however, that these products which are enormously used in war are too dangerous or not sensitive enough for commercial use. This was the very complaint laid against nitroglycerin until Alfred Nobel overcame the difficulties and produced dynamite.

The two explosives especially recommended for commercial use are T. N. T. and picric acid. T. N. T. means trinitrotoluol, just as dynamite might be said to be made of trinitroglycerin and earthy bodies. The first T. N., then, means trinitro, and signifies what we might call three tails of nitric acid stuck onto the molecule. Toluol is one of the light liquids that come over in the distillation of coal tar. When adequately combined with nitric acid it becomes T. N. T.

Picric acid enjoys the distinction of being both a yellow dyestuff and an explosive. To make that, they start with carbolic acid, which also comes from coal tar. If there is a great demand for carbolic acid and it is dear, chemists can take benzol, a more abundant tar product, and do a few things to it whereupon it will also become carbolic acid. If we treat carbolic acid in just the same way as glycerin or toluol, with nitric and sulphuric acids, until those three tails from the nitric acid are hooked on, we have picric acid, the chemical name for which is trinitrophenol.

A number of other similar explosives are known but these are the leaders. The only troublesome point is lack of familiarity with their ways. In Europe before the war they were used very generally as safety explosives and they are in vast use to-day in the war. We are less inclined to change than Europeans are in some respects, once we get used to a thing. This holds true in chemistry rather than in mechanics. Nevertheless, we need in industry the cheapest of explosives consistent with entire safety of human life. We need, therefore, research in this respect if we would decrease the cost of blasting. But it would not be fair to say we need shaking up in this connection.—*By Ellwood Hendrick, in The Practical Druggist, November, 1917.*

HOSPITAL CORPSMEN COMMENDED.

From: Commanding Officer.

To: Bureau of Medicine and Surgery. Via Force Commander.

Subject: Johnson, A. M., C. Ph. M., commendation of.

"1. About 7.30 p. m., January 16, 1918, when a shell fired by the S. S. ——— struck the after gun of this vessel, killing one man and injuring four members of the gun's crew, two of them seriously, Johnson, A. M., chief pharmacist's mate, quickly and efficiently cared for the wounded, stopping the hemorrhages, and made the injured as comfortable as possible. When Assistant Surgeon T. D. Baxter, from the U. S. S. ———, was placed on board about an hour later, he stated that Johnson had performed his duty exceptionally well and carefully, giving the men the proper amount of morphine and dressing the wounds, which were exceedingly bad in two cases, most properly.

"2. Johnson's performance of duty aboard this vessel has always been very satisfactory and his correct diagnosing of cases has been most marked. He is exceedingly careful and zealous in the performance of his duties.

"—————"

"HEADQUARTERS AMERICAN TROOPS IN ENGLAND,

"December 12, 1917.

"I desire to commend the excellent work of Chief Pharmacist's Mate Walker S. Hollva, U. S. N., who has acted as my senior Hospital Corps sergeant at this camp during the past month, during which time I have been without any other medical assistance. His knowledge of medicine and surgery, as well as the routine work of the office, has made him invaluable as an assistant, while his tact, good judgment, and alert soldierly action have never been wanting. He has acted as medical officer of the —th Company of Marines in the absence of a regular surgeon. I feel that without him I would have been unable to cope with the difficult conditions incident upon lack of personnel and medical supplies in a camp through which large bodies of troops are constantly passing, among whom various contagious diseases have prevailed.

"I recommend him to the notice of his superior officers as a man fully competent and one deserving promotion.

(Signed)

"MAJ. HENRY C. COE, M. R. C., U. S. A.,
"Chief Surgeon, American Troops in England."

"U. S. S. ———,
 "UNITED STATES NAVAL STATION,
 "Tutuila, Samoa, September 17, 1917.

"From: Commanding officer.

"To: Commandant.

"Subject: Assistance rendered one of the Australian troops at Rabaul by Pharmacist Kellers.

"* * * * On the evening in question I was in an automobile in company with Pharmacist Kellers and the administrator of Rabaul on our way to a dinner party. Just as we reached the ice plant one officer and several men came out and hailed the machine, asking, "Is that the doctor's car? One of the men in the plant has had an arm torn off and is about to bleed to death." The administrator said "No," but I immediately informed him that Pharmacist Kellers would go in and render all the assistance possible. I accompanied Pharmacist Kellers to the ice plant and found the man in a very serious condition, no one apparently being able to give the necessary first aid. Pharmacist Kellers immediately stepped into the breach, applied a tourniquet, stopped the flow of blood, and had the man ready to go to the hospital at Rabaul when the station surgeon arrived."

The above incident occurred during the trip of the U. S. S. ——— to Rabaul in connection with the repatriation of certain Solomon Islanders, this trip being made at the request of the Government of Western Samoa and authorized by the Navy Department. Pharmacist Kellers was sent on this trip as the medical officer of the ———.

"Secretary Daniels has commended Floy Herman Bates and Francis Marble Blair, pharmacist mates, third class, serving on board a United States ship, for their gallant efforts to rescue from drowning a bather who had got beyond his depth at Ocean Beach, Cal. The attempt of these men to rescue the drowning man is especially commendable, as neither man had ever before been in the surf."—Fleet Review, November, 1917.

"Among the enlisted men especially commended when the U. S. S. *Fanning* recently captured a German U-boat was Chief Pharmacist's Mate Elzer Harwell, Scotts Hill, Tenn. Incidents in the capture of a German U-boat by the American destroyers show a marked contrast to the sea ethics of the Germans. * * * After the U-boat had disappeared beneath the sea Chief Pharmacist's Mate Harwell and Coxswain Cooner, of the *Fanning*, which was engaged in rescue work, leaped overboard and risked their lives to save two drowning German sailors."—Washington Post, Sunday, December 30, 1917.

"Among the men of the U. S. S. *Cassin* who were cited recently by Vice Admiral Sims for coolness and qualities of leadership was George F. Klein, chief pharmacist's mate."—Fleet Review, December, 1917.

"A little outside of the line of his profession was an act of bravery by Frederick Randolph Ferguson, pharmacist's mate, second class, at Feeding Hills, Mass., October 13 last. Ferguson, who is attached to the Navy recruiting station at Boston, was appealed to by the police to help in the capture of a desperate murderer who had already done away with three persons. Ferguson entered the house in which the man had taken refuge and, breaking the door of the room in which he had barricaded himself, made him a prisoner. Secretary Daniels commended Ferguson for his bravery."—Fleet Review, January, 1918.

EXTRACTS FROM REPORTS.

Extract from sanitary report, U. S. S. ———:

"Among the hospital corpsmen on board there has been brought about an example of teamwork which is most creditable to the spirit of the men. They have put up with many discomforts uncomplainingly; they have stood watches at night in the dark under the most trying circumstances; they have saved life by their alertness and ability, and I feel they deserve the highest praise for taking hold of strange and unpleasant duties in the manner they have.

"Until one has passed through the experience, the difficulties of caring for very ill patients without light can not be appreciated. From sunset to sunrise the only lights available are those on a blue light circuit, very dim, and affording scarcely enough light by which to read a thermometer. The whole sick bay is in darkness, and the care of patients at night is undertaken almost entirely by the sense of touch."

Extract from weekly report of the brigade surgeon, United States Marine forces, Haiti:

"Of the 32 hospital corpsmen sent to Haiti for intensive training, 24 remain at the field hospital. These men have made excellent progress and are performing satisfactory duty in the various wards, night duty, administering venereal prophylaxis at the Marine barracks, field hospital, and commissary depot, duty in the operating room, dispensary, office, and laboratory. Of the remaining eight of these men, six have been transferred to Cape Haitien, where they relieved men of long service in Haiti in order that the latter could be transferred to the United States."

PROMOTION.

The annual circular of the Bureau of Navigation states, on page 9, paragraph 37, "A member of the Hospital Corps below the rating of chief pharmacist's mate (permanent) may be disrated by his commanding officer upon the recommendation of the medical officer."

This provision should sound the death knell of inefficiency in the Hospital Corps. The same paragraph further states medical officers are expected to use discretion and careful judgment in recommending men for advancement, with the view that only the well qualified and experienced may be advanced to the various ratings. It is not desired to advance unqualified men because of their length of service only, but to advance those who are fully qualified and who have a satisfactory knowledge of the duties of the various ratings to which they seek advancement. Since the last issue of the SUPPLEMENT the Bureau of Medicine and Surgery has received information that the following men have been promoted:

TO PHARMACIST'S MATES, FIRST CLASS.

Albright, M.	Felton, R. S.	Lemke, G. F. W.
Amato, L. I.	Foll, E. F.	Lewis, W. D.
Auger, G. LaM.	Francis, S. B.	McClendon, S. J.
Beamer, C. F.	Gardner, J. C.	McLean, N. H.
Bedard, W. R.	Gemme, H. F.	McPartland, J. R.
Berger, R. N.	George, H. F.	Mason, J. C.
Blackwell, W. S.	Goodwin, C. D.	Miller, Harry.
Bland, J. R.	Gough, J. S.	Miller, K. H.
Bogard, D.	Hammer, S. Q.	Moore, A. H.
Bollerup, E. R.	Hanks, M. L.	Newland, V. E.
Bowen, D. J.	Hart, I. D.	Orr, A. V.
Brown, F. M.	Hartman, A. M.	O'Neill, D. H.
Brown, R. D.	Hayden, W. H.	Paul, E. F.
Brown, W. T.	Hayne, J. M.	Pawlowski, H.
Cheetham, R. N.	Heinrich, E. T.	Peterson, C. D.
Clark, C. P.	Herman, H. E.	Pico, F. C.
Cook, C. E.	Hickok, H. C.	Piper, E. L.
Collins, R. K.	Hocking, H. J.	Pryor, J. H., jr.
Cope, M. B.	Hostetter, W.	Robinson, H. D.
Cornell, W.	Hughes, S.	Rollins, H. F.
Couch, C. L.	Jacobsen, A. P.	Rounds, H. B.
Cowlin, D. G.	Jacobson, I. C.	Scheer, J. W.
Craig, C.	Johnson, C. F.	Simpson, J. F.
Creppel, W. B.	Johnson, G. H.	Solleridge, S.
Dale, W. C.	Joiner, G. McG.	Spindle, L. L.
Davis, Lee.	Jones, C. U.	Timmons, C.
Dean, W. R.	Kane, Earl.	Toomey, A. R.
Delling, F.	Kerst, Carl.	Volke, A. M.
Dent, M. E.	Kercheval, R. O.	Washburn, W. A.
Dixon, E. C.	Kipp, R. H.	Waters, R. A.
Dossin, C. A.	Kirkpatrick, O. Y.	Watson, A. G.
Emmons, H. M.	Kriete, J. H.	Wentworth, C. E.
Fabian, W. B.	Lane, P. M.	Williford, H. L.
Peck, G. W.	Leforgeais, F. J.	Wilson, G. A.

TO CHIEF PHARMACIST'S MATE.

Akerberg, K. H.
 Alderman, H. S.
 Anderson, F. H.
 Arms, R. P.
 Arthur, J. L.
 Ashby, R.
 Baker, E. R.
 Barker, W. L.
 Beamer, C. F.
 Beckett, J. C.
 Bedard, W. R.
 Bell, J. H.
 Blood, L. T.
 Bollerup, E. R.
 Buzhardt, A. H.
 Carr, R. A.
 Chesters, C.
 Clanton, W. C.
 Cronk, P. B.
 Cunningham, J. T.
 Davis, J. L.
 Dean, C. M.
 Dixon, E. C.
 Drum, C. H.
 Field, L. K.
 Flynn, E. W.
 Gardner, J. C.
 Graham, E.

Griffith, H. D.
 Hanley, N. L.
 Henwood, W. B.
 Hostetter, W.
 Hudnall, S. I.
 Hunter, G. A.
 Jarvis, J.
 Johnson, G. H.
 Johnson, O. K.
 Kelly, J. J.
 King, R. L.
 Klingler, H. J.
 Lane, C. M.
 Lane, J. McR.
 Leckle, R. G.
 Leonard, A. C.
 Lucy, H. J.
 Mahood, H. F.
 McLean, N. H.
 Metzker, S. C.
 Milligan, S. W.
 Murphy, E. F.
 Neuman, C. W.
 Norton, D. H.
 Nostrand, G. W.
 Osiek, P. H.
 Pawlowski, H.
 Proudfoot, J. L.

Reese, P. T.
 Rugg, S. M.
 Sanson, W. H.
 Schenck, J. F.
 Schultheis, W. Jr.
 Scott, R. A.
 Shabek, L. F.
 Shober, M. LaM.
 Schofield, W.
 Shircliffe, C. A.
 Spindle, L. L.
 Stamps, B. B.
 Storkan, O.
 Streets, S. L.
 Strong, S. F.
 Thompson, R. V.
 Tracey, G. M.
 Walker, L. M.
 Ward, J. L.
 Warne, R. T.
 Wells, A. J.
 Wheeler, H. E.
 Wilson, Elmer
 Wilkins, S. P.
 Wolcott, L. F.
 Wolford, H. W.
 Zeek, C.

The following men have been recommended by the board by which they were examined, but as yet the Bureau of Medicine and Surgery has received no information of their actual promotion:

TO PHARMACIST'S MATE, FIRST CLASS.

Atwood, C. L.
 Barnett, D. A.
 Beebe, DeL. A.
 Benjamin, E. L.
 Cason, W. M.
 Chapman, G. McK.
 Chors, H. J.
 Davis, J. T.
 Dunlap, B. C.

Glick, B.
 Gross, H. A.
 McIntee, W. H.
 Martin, R. E.
 Mason, A. S.
 Moody, J. A.
 Rice, B. T.
 Roberts, H. A.
 Ross, J. L.

Saunders, T. McL.
 Schlosser, R. B.
 Smith, T. R.
 Stewart, O. M.
 Stine, W. A.
 Taft, S. C.
 Thompson, R.
 Whitehead, M. J.

TO CHIEF PHARMACIST'S MATE.

Albright, M.
 Boner, T. J.
 Boyle, J. A.
 Brauer, E. C.
 Brown, Michael.
 Cochrane, R. S.
 Davis, G. T.
 Dennis, H. J.
 Dent, M. E.
 Dolcater, J. H.
 Ericson, H. W.
 Fenneman, A.
 Ferguson, C. W.
 Gemme, H. F.

Henry, M. L.
 Holcomb, W. C.
 Jackson, J. A.
 Jacobsen, A. P.
 James, R. W.
 Larsh, L. A.
 Lawrence, G. M.
 Loegel, G. M.
 McClendon, S. J.
 Myers, W. W.
 Neuffer, L. W.
 Olinger, J. B.
 Poe, F. C.
 Ragan, W. E.

Rasmussen, A. E.
 Rickard, G. F.
 Schulze, F. H.
 Skillman, H. W.
 Stanley, A. E.
 Stevens, W. N.
 Stommel, C. J.
 Summers, R.
 Tonsic, F.
 Watson, C. A.
 Wester, R. E.
 Wilde, E. C.
 Woodward, W. H.
 Young, A.

THE NAVAL PHARMACIST.

For years it has been extremely difficult to obtain promotion to the warrant grade for members of the Hospital Corps. For years the loyal, efficient, hard-working chief petty officer of the Medical Department who desired to continue in association with the medical officers of the service found the door to advancement to the warrant grade closed and reluctantly some of these men were forced to look to other branches of the Navy as the only way in which to obtain promotion. Every year a few left the Hospital Corps to enter industrial plants as first-aid men or to fill positions in chemical and pharmaceutical laboratories, etc., in civil life, and every year a few left the Hospital Corps to become pay clerks or other warrant officers. Just at the time in their career when, theoretically, their services would be of most value to the Medical Department some would leave the Hospital Corps because of the poor opportunity for advancement beyond the rating of chief pharmacist's mate.

During the year that has just passed—1917—the Navy Department has followed a far more liberal policy, with the result that by January 1, 1918, 170 chief pharmacist's mates were advanced to the warrant rank of pharmacist or temporary pharmacist.

This advancement of hospital corpsmen to warrant rank is a real recognition of what the Medical Department of the Navy has long known—that is, that the experienced and able hospital corpsman is worthy of advancement to the warrant rank and that unless such an opportunity for advancement is given him the most ambitious and able hospital corpsmen will tend to leave the Hospital Corps at the time when their services are of the greatest value to the Medical Department. When this occurs the years spent by the medical officers of the Navy in training the hospital corpsman go for naught.

A surgeon who recently enrolled in the Naval Reserve Force and who, during the year 1917, came in contact with one chief pharmacist's mate who had recently been promoted to the warrant rank of pharmacist, stated that a man as able to be a doctor's assistant as was this pharmacist should command a salary in civil life of approximately \$2,500 a year. The naval pharmacist is now a recognized and important factor in the personnel of the medical department. Medical officers expect him to be able to create for them the proper environment in which to work. They expect that he will be able to

keep the medical department of the ship, station, or hospital well supplied with all the thousands of articles which are needed, that he will be able to act as a leader and teacher of hospital corpsmen, able to insure accuracy and completeness in medical records and returns, able to assist the medical officer in command of a naval hospital in the variety of work which confronts him in the management of the hospital.

At sea to-day the naval pharmacist has become an important factor in the sick bay of the larger naval vessels and on board the hospital ships, and it is not unfair to predict that the day is not far distant when every large naval vessel will have a pharmacist attached to it and when that day arrives and when enough pharmacists have been appointed to fill all these billets, the medical department of the Navy will have taken one more step forward in efficiency. The pharmacist has taken an important place in connection with the sanitary and medical supply needs of medical officers on duty with expeditionary forces of the Marine Corps, in naval hospitals, both at home and abroad, in large training stations, at navy yards, naval medical supply depots, in X-ray, chemical, and bacteriological laboratories. The naval pharmacist has taken an important place and has proven equal to enlarged responsibilities and more difficult tasks.

The temporary pharmacist (and likewise the permanent pharmacist) will find in the correspondence course now being carried on for pharmacists an opportunity to learn of the newer responsibilities and duties of the pharmacist in connection with the recently enlarged personnel of the Navy, and to study the solution of the problems in the answers to the questions sent out by the director of this course. He will learn how he may measure up to new responsibilities and duties when they present themselves. It is also hoped that the ambitious chief petty officers who are striving to elevate themselves to warrant rank will take full advantage of the correspondence course questions and answers as published in the SUPPLEMENT.

The temporary pharmacist holds his commission only until the end of the war, and prior to that time he may lose it if not fully able to undertake the duties of his grade. Every temporary and permanent pharmacist should, through study, and by observation and endeavor so improve himself that he may approach the ideal of being able to meet any task which may confront him at any time.

The first problem and answer of the correspondence course for pharmacists follow.

(Ed.)

CORRESPONDENCE COURSE FOR PHARMACISTS.

PROBLEM NO. 1.

You are detailed to duty as the senior pharmacist of a hospital ship having a capacity of 500 beds for patients. The medical officer in command desires a complete outline of all necessary equipment for the hospital ship which directly concerns the medical department thereof, the outlines to be given by departments, or classes, into which the necessary equipment for such a vessel naturally divides itself most conveniently for purposes of making purchase or otherwise obtaining the same, and for proper inventory on board as well.

(a) Give an outline of all the necessary equipment directly concerning the medical department of a hospital ship by classes, as indicated above.

(b) Show the proper source of each lot or class of equipment, i. e., from whom procured or who is responsible for its being procured.

(c) Give the proper requisition or other form necessary in each instance, and state to whom the request should be forwarded for action.

(d) Mention the equipment of a hospital ship directly concerning the medical department thereof which you would expect to find installed on board the ship when delivered by the contractor.

NOTE.—(1) An itemized list of the several classes referred to above need not be given; (2) equipment having to do with the nautical side (navigation) of the ship need not be mentioned.

ANSWER.

INSTALLED BY CONTRACTOR UNDER C. & R.

Sterilizers and accessories.

Disinfectors and incinerators.

Laundry equipment.

Ice machines and refrigerators.

Patient-handling appliances, including restraint apparatus.

Vacuum-cleaning, telephone, and ventilating systems.

Commissary appliances for: Patients' and complement's galley, officers' galley, diet kitchens, bakery, sculleries, pantries, general mess issuing room, potato-peeling room, butcher shop, ice-crushing and cream-freezing room.

All fixed furniture, berths, lockers, shelving, etc., in the wards, staterooms, sick rooms, linen rooms, dead room, mess rooms, ship's store, post office, dark room, cold storage, insane cells, etc.

Also certain necessary plumbing fixtures in the toilet and wash rooms autopsy room, and acute treatment rooms.

Laboratory animal pens.

Equipment in hydrotherapeutic, thermotherapeutic, and massage rooms.

Barber shop equipment.

MANUFACTURED BY C. & R.

(Letter form to M. & S.) Tents.

FROM NAVAL MEDICAL SCHOOL.

(Form 4 to Bur. M. & S.) Microscopical outfits.

(Letter form direct to school.) Bacteriological supplies listed in paragraph 3556, Manual for Medical Department, 1917.

PLACED ON BOARD BY OTHER BUREAUS.

(*Ship's allowance.*)

Bureau of Supplies and Accounts: Athletic gear; stationery; mess gear; table, glass, china, and plated ware; table linen and towels; typewriters; safes (paymaster's); utensils—baker's cooking, diet kitchen, pantry, and mess.

Bureau of Construction and Repair: Mattresses and pillows; bedding and linen for staterooms; rugs; splint stretchers; office and stateroom furniture; safes (other than paymaster's); glassware (stateroom only); mess tables and chairs.

Bureau of Navigation: Ship's library.

FROM NAVAL MEDICAL SUPPLY DEPOTS.

Form "B" to Medicine and Surgery: Medicines and disinfectants; tablets and hospital stores; surgical instruments and appliances (partial); surgical dressings; dispensary, laboratory equipment, and miscellaneous (partial); hospital appliances (partial); bedding and linen for patients; books (on supply table only); stationery (partial).

Form 4 to Medicine and Surgery: Articles in stock, not on Form "B," e. g., caskets.

Letter form to Medicine and Surgery: Dental outfits; expeditionary outfits; vaccines and sera.

Form O (direct to depot): Blank forms.

PURCHASED IN OPEN MARKET.

Supplies & Accounts Form 44 to S. and A. via Medicine and Surgery: Surgical instruments and appliances not on Form "B"; medicines, disinfectants, and hospital stores not on Form "B"; instruments and appliances for eye, ear, nose, and throat department; X-ray outfit and accessories; photo outfit and dark-room equipment; laboratory equipment (chemical, bacteriological, and media room, including laboratory animals and their food); medical library; laundry supplies; special dental appliances, workshop; embalming outfit; printing outfit; special dispensary supplies and appliances; ambulances for use with expeditionary outfit; hospital furniture and appliances for wards—surgical, medical, contagious, venereal, convalescent; eye, ear, nose, and throat room; quiet rooms; dressing rooms; toilets; dental offices; sick officers' rooms; endoscopic room, autopsy room; acute-treatment room; operating pavilions—main, instrument, etherizing, scrub-up, sterilizing, operating rooms; ward; current medical literature.

CONTRIBUTIONS.

Save your copy of the SUPPLEMENT and use it for reference. All information contained in its pages may not be of immediate value but may be just what you need at a later time. Each number contains information not found in the "Handy Book."

The contributions desired are articles dealing with measures and methods of treating the sick and injured, teaching and training, special duties, suggestions for improvement in any line of Hospital Corps work; pictures illustrating Hospital Corps activities; the corps on detached duty, on foreign stations, at training schools, landing parties, transportation of sick and injured, surgical X-ray and laboratory procedure, tropical duties, war pictures illustrating the work of the Hospital Corps; in short, any pictures which will be of interest and instruction to the corps.

The editor has been gratified by the interest already taken by hospital corpsmen and others who have submitted articles and pictures for publication in the SUPPLEMENT. It is hoped that the interest will continue and that hospital corpsmen, doctors, nurses, dental officers, will all remember that they can talk to one another in the pages of this publication in a way which will be of benefit to all.

Several contributions have been received which, because of limited space, could not be published in this number.

The SUPPLEMENT will publish only material that is of special interest and benefit to the Hospital Corps, the editor reserving the right to turn over to other Navy magazines or papers material which is of interest to the Navy at large, rather than to the Hospital Corps in particular. Owing to the uncertainty of mail transmission the editor does not assume responsibility for the return of pictures, articles, etc., contributed.

Endeavor will be made to answer through these columns any inquiries submitted by hospital corpsmen that are of general interest to the corps. Strictly personal inquiries will not be answered. Unsigned letters will not be considered.

Address all communications to:

EDITOR OF THE SUPPLEMENT,
*Bureau of Medicine and Surgery,
Navy Department,
Washington, D. C.*

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